POWER SYSTEMS NETWORK MANAGEMENT

PROTECTION AND SUBSTATION AUTOMATION SYSTEMS

WBS NO: S-13656

ABB AUTOMATION COMPANY LTD.,
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company

CLIENT : National Grid SA

PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY

SUBSTATION : S/S 8709

CONTRACT NO. : 11131113/00

TITLE : Assembly Drawing - +SAS I/F-3

REV. NO.	DATE	DESCRIPTION
01	13 48	AS MANUFACTURED
00	13 20	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY JKR

DATE STARTED 15.3.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COVER SHEET

SAS INTERFACE PANEL +SAS I/F-3

S/S 8709 S-13656

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

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NG/D2-D (2012/01)

DMS VECTOR NGD200

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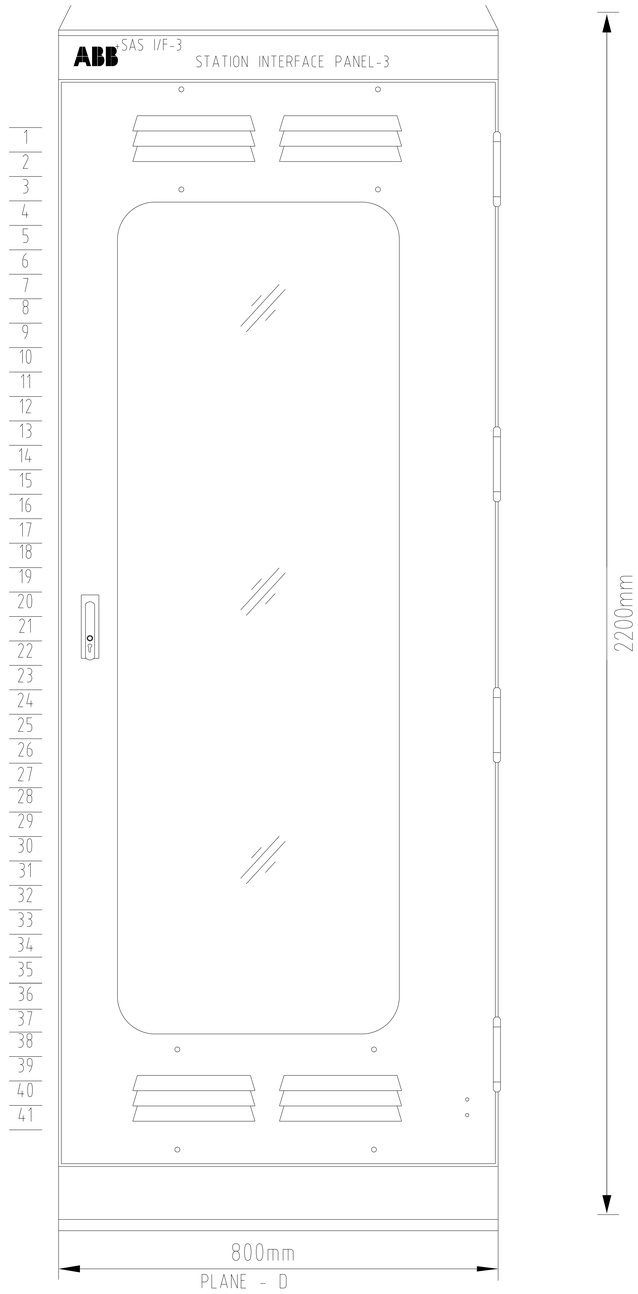

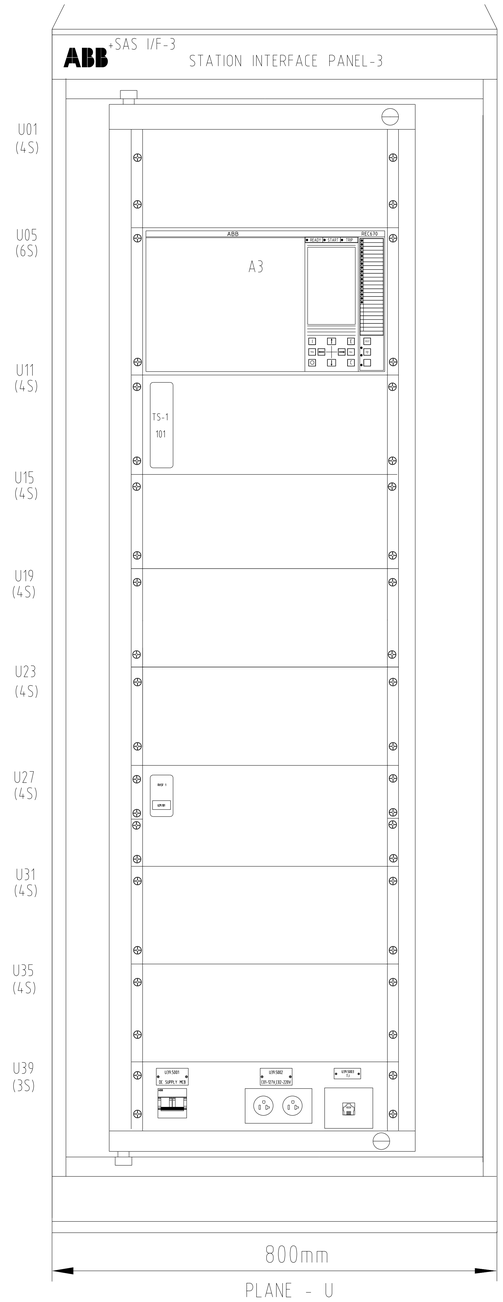

MOUNTING PLANES	
EXTERIOR COLOUR	AIRCRAFT GREY COLOUR TO SHADE NO. RAL7038
INTERIOR COLOUR	SIGNAL WHITE COLOUR TO SHADE NO. RAL9003
CUBICLE TYPE	VSH 200
FRAME	HINGED FRAME, MOVABLE
CUBICLE TYPE	FRONT ACCESS
MATERIAL OF CONSTRUCTION	ALUZINK STEEL
DIMENSIONS	2200 X 800 X 800 mm (H X W X D)
CLASS OF PROTECTION	IP 41
APPROX WEIGHT	200KG
CABLE ENTRY	BOTTOM

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

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OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

ASSEMBLY DRAWING
SAS INTERFACE PANEL +SAS I/F-3
S/S 8709 S-13656
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
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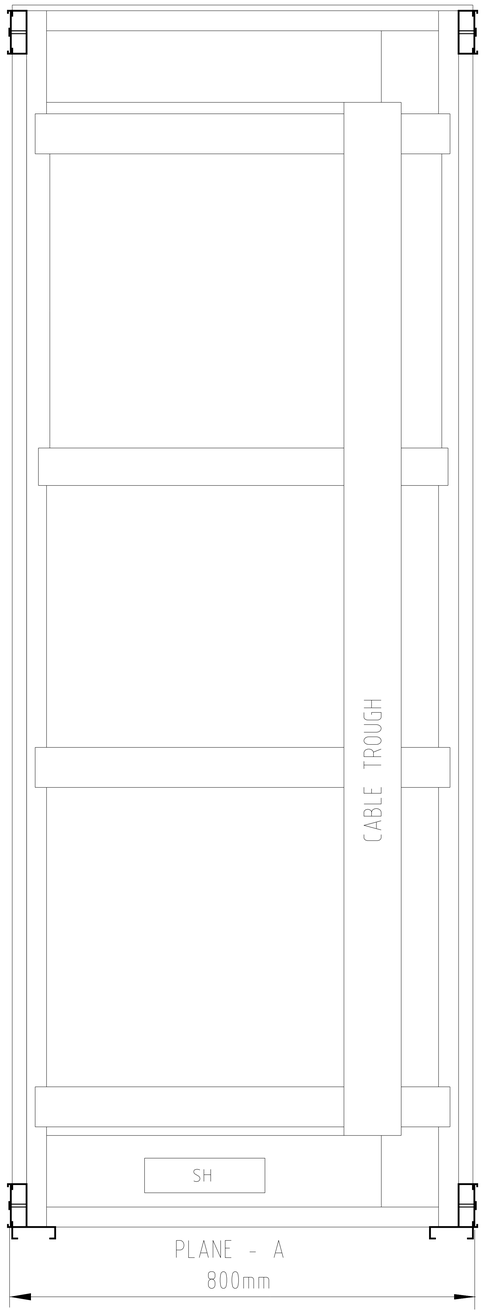

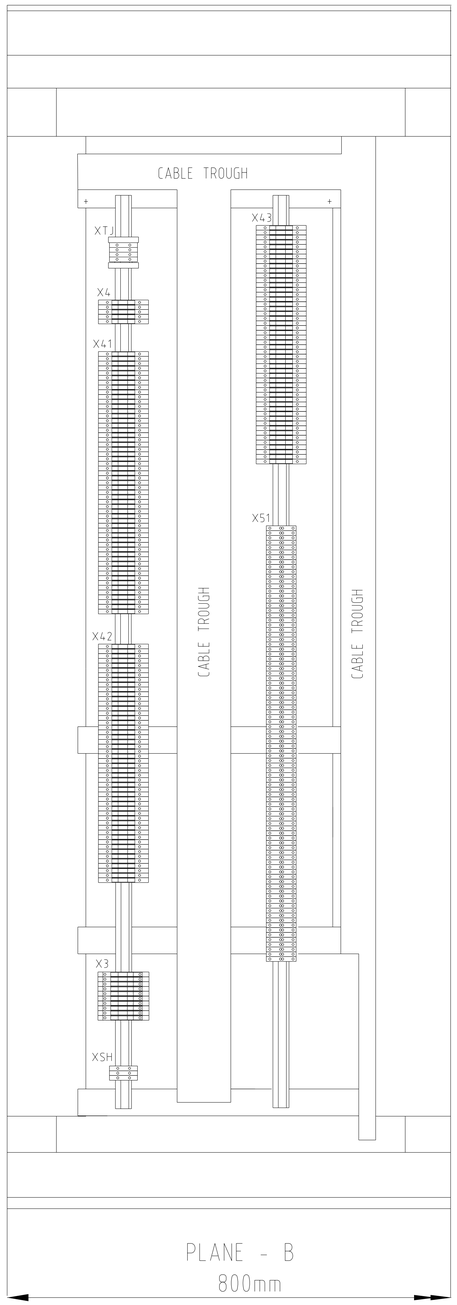

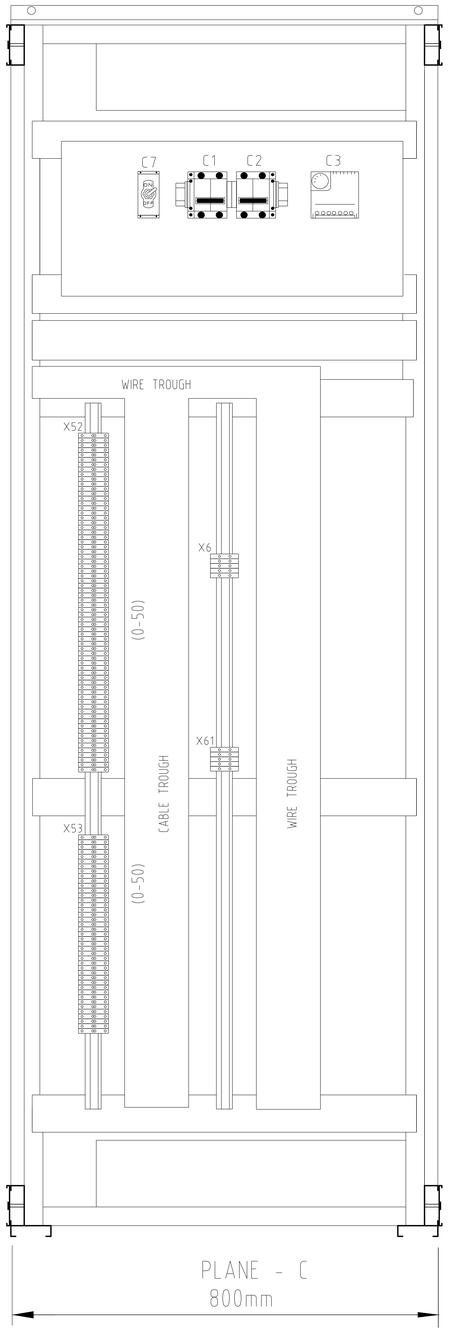

PLANE - B & C

SCH.REF	DESCRIPTION	TYPE	MAKE
X3	AC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
X4	DC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
X41,X42	DC CIRCUITS	D6/8.ST1.RS	ENTRELEC
X43			
X51,X52	CONTROL CIRCUITS	M6/8.RS	ENTRELEC
X53	CONTROL CIRCUITS	M6/8.RS	ENTRELEC
X6	ALARM SUPPLY	M6/8.RS	ENTRELEC
X61	ALARM CIRCUITS	M6/8.SNB	ENTRELEC
XTJ	TELEPHONE JACK	M6/8.RS	ENTRELEC
XSH	SPACE HEATER	M6/8.RS	ENTRELEC

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AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 48	AS MANUFACTURED
00	13 20	FOR APPROVAL

DRAWN BY RIZ CHECKED BY JKR
DATE STARTED 15.3.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

ASSEMBLY DRAWING
SAS INTERFACE PANEL +SAS I/F-3
S/S 8709 S-13656
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
نقل الكهرباء
National Grid SA

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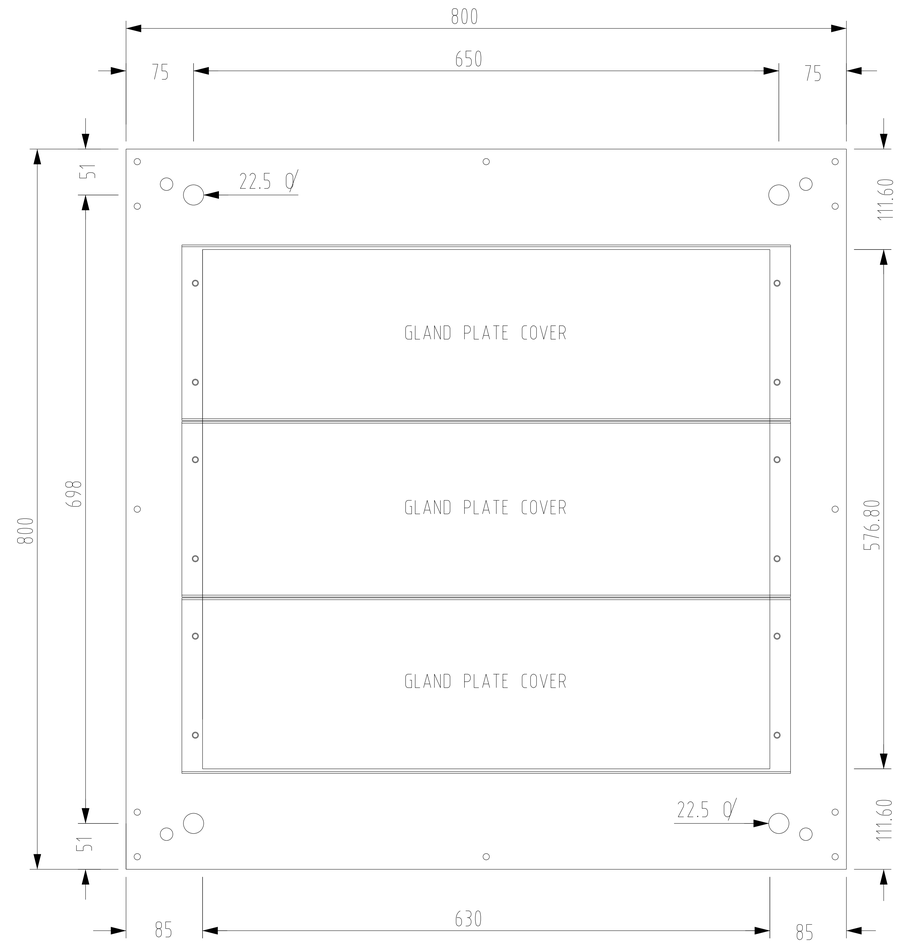
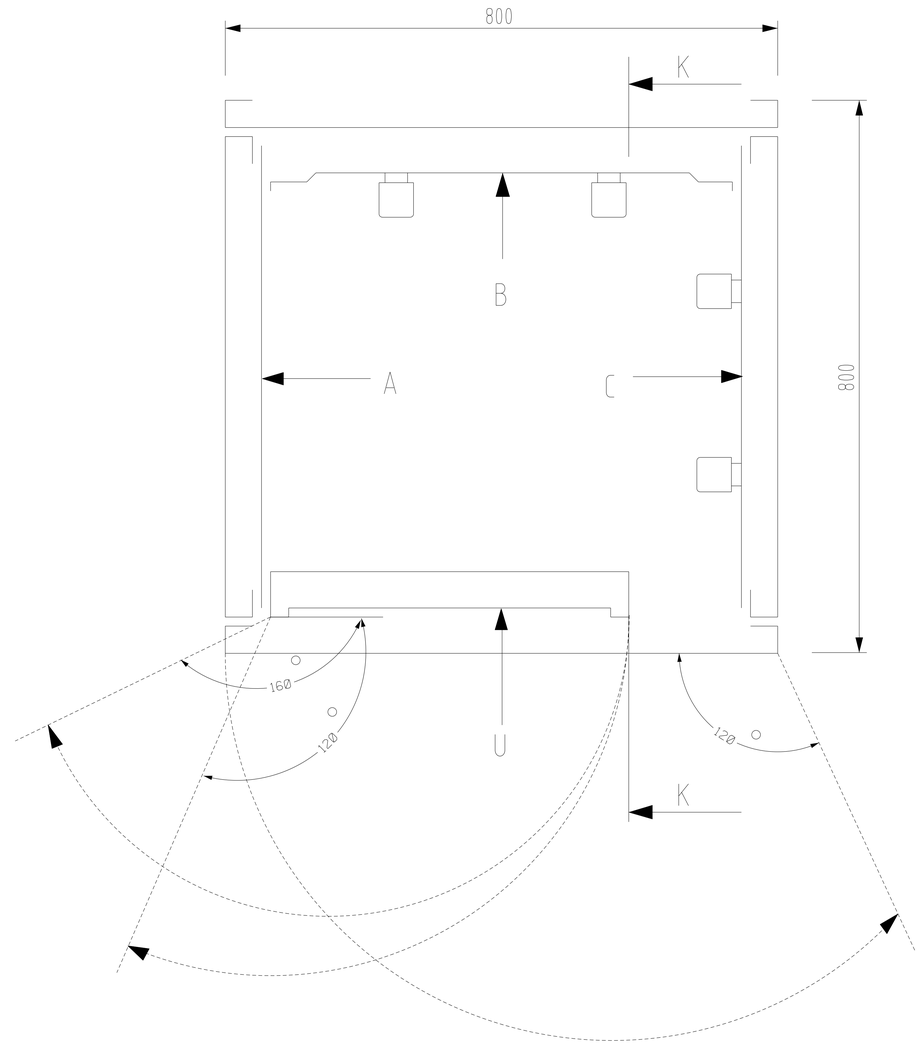
P	C421	CD-323014	G02	G03	01

NG/D2-D (2012/01)
DMS VECTOR NGD200

BASE PLATE/ FOUNDATION



PLAN



AS-BUILT BY _____ DATE _____	CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656	ASSEMBLY DRAWING	الشركة الوطنية لنقل الكهرباء — نقل الكهرباء National Grid SA
			SAS INTERFACE PANEL +SAS I/F-3	
01 / 13 48 / AS MANUFACTURED	DRAWN BY RIZ	CHECKED BY JKR	S/S 8709 S-13656	
00 / 13 20 / FOR APPROVAL	DATE STARTED 15.3.2013	DATE COMPLETED _____	RIYADH SAUDI ARABIA	
REV. NO. / DATE / DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC		

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
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NG/D2-D (2012/01)

DMS | VECTOR | NGD200

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TOP VIEW FOR EARTHING BAR

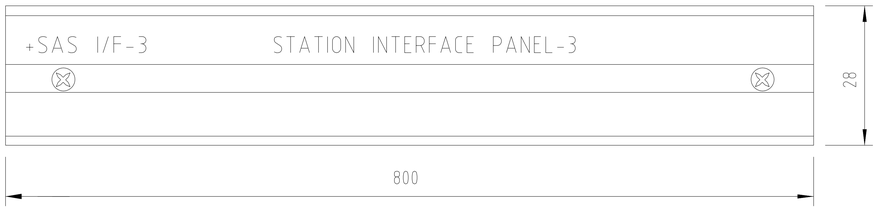
MANUFACTURING LABEL

ABB ABB Automation Co.Ltd.

PROJECT	: National Grid SA - S/S 8709
ORDER REFERENCE	: 2875 RF S13656
YEAR OF MANUFACTURE	: 2013
PANEL NO.	: +SAS I/F-3
DRAWING NO.	: S13656-CD-323015

MADE IN THE KINGDOM OF SAUDI ARABIA

U PLANE TOP LABEL



U PLANE BOTTOM LABEL

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01	13 48	AS MANUFACTURED
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ASSEMBLY DRAWING

SAS INTERFACE PANEL +SAS I/F-3

S/S 8709 S-13656

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

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POWER SYSTEMS NETWORK MANAGEMENT

PROTECTION AND SUBSTATION AUTOMATION SYSTEMS

WBS NO: S-13656

ABB AUTOMATION COMPANY LTD.,
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RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company

CLIENT : National Grid SA

PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY

SUBSTATION : S/S 8709

CONTRACT NO. : 11131113/00

TITLE : LIST OF APPARATUS +SAS I/F-3

AS-BUILT BY _____ DATE _____

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CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

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OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COVER SHEET

SAS INTERFACE PANEL +SAS I/F-3

S/S 8709 S-13656

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

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SR. NO.	GA REF.	SCH. REF.	D E S C R I P T I O N	SHEET NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION	COUNTRY OF ORIGIN
			STATION INTERFACE PANEL-3						
1	U05.5001	A3	STATION COMMON ALARM SWITCHING EQUIPMENT WITH	291 TO 296	1	REC 670	ABB	1MRK 002814-AC	SWEDEN
			FOLLOWING SPECIFICATION						
			AUX : EL=90-250V DC						
			FREQ : 50/60HZ						
			BINARY INPUT : 14 NOS(PER CARD 16 INPUTS RL=110-125DC)						
2	U11.101	TS-1	TEST SWITCH FOR REC 670 (A3)	245	1	RTXP18	ABB	RK 926 115-AN	SWEDEN
3	U27.101	74IF	DUAL TARGET RELAY (REVERSE FLAG)	245	1	RXSF1	ABB	RK 271 019 AN	SWEDEN
			(A1 DC FAIL/SPARE)						
			CONTACTS :1NO+2NC PER COIL						
			AUX.VOLT :1NO+2NC PER COIL						
			FLAG :SELF RESET						
4			MCB 2 POLE 6A, FOR DC SUPPLY	216	1	S 282 UC-K6	ABB	GH S282 0164 R0377	GERMANY
			WITH 2NC AUXILIARY CONTACT			S2-H02		GH S270 1916 R0003	
	U39.5001	Q1	Q1 IF+ SUPPLY						
									FRANCE
5	U39.5002	C01	CONVENIENCE OUTLET 10A, 127V AC	211	1	USM45 &	LEGRAND	74140 & 74180	
		C02	CONVENIENCE OUTLET 10A, 220V AC			USMS45			
		C1,C2	MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR	211	2	S202P-K10	ABB	2CDS 253 001 R0104	GERMANY
			CONVENIENCE OUTLET WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS			S2C-H11L		2CDS 200 936 R0001	
6		C3	THERMOSTAT FOR SPACE HEATER, 5-60 C	211	1	SK 3110	RITTAL	SK 3110	THIWAN
7	U39.5003	TJ	TELEPHONE JACK 1GANG 4WIRE	211	1	EDF410	EDISON	EDF410	SWEDEN
8		C7	ON/OFF SWITCH FOR SPACE HEATER	211	1	M2SS1-10B	ABB	1SFA 611 200 R1006	
						MCBH-10		1SFA 611 605 R1101	
9		DS	DOOR SWITCH FOR CONTROL OF CUBICLE INTERNAL ILLUMINATION LAMP	211	1	LS30P 13B02	ABB	1SBV 010213 R1202	SWEDEN
10			INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR	211	1	T-4	SUNON	SP-20W	
			127V AC, 60Hz SUPPLY, 20W						
11		SH	SPACE HEATER, 150W, 120V, 60Hz	211	1	RICA	GRUPPO	1FZEK 006 C001	ITALY

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OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

LIST OF APPARATUS

SAS INTERFACE PANEL +SAS I/F-3

S/S 8709 S-13656

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
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NG/D2-D (2012/01)

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SR. NO.	ITEM DESIGNATION	D E S C R I P T I O N	SHEET.NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION	COUNTRY OF ORIGIN
11	X3	SPRING LOADED TERMINAL BLOCKS FOR DISCONNECTABLE AC CIRCUITS	301	10	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	FRANCE
	X4	SPRING LOADED TERMINAL BLOCK FOR DISCONNECTABLE DC CIRCUITS	301,302	5	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	FRANCE
	X41,X42	SPRING LOADED TERMINAL BLOCK FOR DISCONNECTABLE DC CIRCUITS	301,302	55,50	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	FRANCE
	X43			50				
	X51,X52	SPRING LOADED TERMINAL BLOCK FOR DC PROTN. CIRCUITS	301,302	70,90	M6/8.RS	ENTRELEC	1SNA 115 688 R2500	FRANCE
	X53			70				
	X61	KNIFE TYPE TERMINAL BLOCKS FOR COMMON ALARM CIRCUITS	302	10	M6/8.SNB	ENTRELEC	1SNA 115 685 R1200	FRANCE
	XTJ	SPRING LOADED TERMINAL BLOCKS FOR TELEPHONE JACK	302	5	M6/8.RS	ENTRELEC	1SNA 115 688 R2500	FRANCE
	XSH	SPRING LOADED TERMINAL BLOCKS FOR SPACE HEATER	302	3	M6/8.RS	ENTRELEC	1SNA 115 688 R2500	FRANCE
	X6	SPRING LOADED TERMINAL BLOCKS FOR ALARM CIRCUITS	302	5	M6/8.RS	ENTRELEC	1SNA 115 688 R2500	FRANCE

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S/S 8709 S-13656

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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
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LABEL REF.	LABEL ENGRAVING	MATERIALS	ENGRAVING	LABEL SIZE	LETTER SIZE
U05.5001	U05.5001 A3	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm
U11.101	U11.101 TS-1	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm
U27.101	U27.101 74IF/SPARE	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm

LABEL REF.	LABEL ENGRAVING	MATERIALS	ENGRAVING	LABEL SIZE	LETTER SIZE
C1	C1 127V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C2	C2 220V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C3	C3 THERMOSTAT	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C7	C7 ON/OFF SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
DS	DS DOOR SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
IL	IL ILLUMINATION LAMP	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
SH	SH SPACE HEATER	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm

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POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13656

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414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company

CLIENT : National Grid SA

PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY

SUBSTATION : S/S 8709

CONTRACT NO. : 11131113/00

TITLE : Schematic Drawing +SAS I/F-3

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SAS INTERFACE PANEL +SAS I/F-3
S/S 8709 S-13656
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
نقل الكهرباء
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NG/D2-D (2012/01)
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COVER SHEET	000	X	X		
CONTENTS SHEET	001	X	X		
GRAPHICAL SYMBOLS FOR DIAGRAMS	011	X	X		
GRAPHICAL SYMBOLS FOR DIAGRAMS	012	X	X		
COMMON LEGEND	013	X	X		
FERRULE AND WIRING DETAILS	014	X	X		
PRIMARY SYSTEM	051	X	X		
AC SUPPLY FOR ILLUMINATION & POWER SOCKET	211	X	X		
AUXLIARY CONTACTS	212	X	X		
DC SUPPLY DISTRIBUTION	216	X	X		
STATION INTERFACE PANEL BINARY INPUTS	231	X	X		
STATION INTERFACE PANEL BINARY INPUTS	232	X	X		
STATION INTERFACE PANEL BINARY INPUTS	233	X	X		
STATION INTERFACE PANEL BINARY INPUTS	234	X	X		
STATION INTERFACE PANEL BINARY INPUTS	235	X	X		
STATION INTERFACE PANEL BINARY INPUTS	236	X	X		
STATION INTERFACE PANEL BINARY INPUTS	237	X	X		
STATION INTERFACE PANEL BINARY INPUTS	238	X	X		
STATION INTERFACE PANEL BINARY INPUTS	239	X	X		
STATION INTERFACE PANEL BINARY INPUTS	240	X	X		
STATION INTERFACE PANEL BINARY INPUTS	241	X	X		

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STATION INTERFACE PANEL BINARY INPUTS	243	X	X		
STATION INTERFACE PANEL BINARY INPUTS	244	X	X		
DC SUPERVISION CIRCUIT	245	X	X		
COMMON ALARM CIRCUITS	290	X	X		
BLOCK REFERENCE	291	X	X		
BLOCK REFERENCE	292	X	X		
BLOCK REFERENCE	293	X	X		
BLOCK REFERENCE	294	X	X		
BLOCK REFERENCE	295	X	X		
BLOCK REFERENCE	296	X	X		
TERMINAL BLOCK REFERENCE	301	X	X		
TERMINAL BLOCK REFERENCE	302	X	X		

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JOB ORDER NO. S-13656

DRAWN BY NSK CHECKED BY JKR

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OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

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RIYADH SAUDI ARABIA

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DMS VECTOR NGD200

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SYMBOL	DESCRIPTION
	FRAME CONNECTION
	EARTH CONNECTION
	RESISTOR
	VARIABLE RESISTOR
	RESISTOR WITH PRESET ADJUSTMENT
	CAPACITOR
	SEMICONDUCTOR DIODE USED AS A CAPACITIVE DEVICE
	OPEN CONTACT, MAKE CONTACT
	CLOSED CONTACT, BREAK CONTACT
	CHANGE-OVER CONTACT, BREAK BEFORE MAKE
	MAKE CONTACT WHICH IS EARLY WHEN OPERATING AND LATE WHEN RELEASING
	BREAK CONTACT WHICH IS LATE WHEN OPERATING AND EARLY WHEN RELEASING
	SWITCHING DEVICE WITH MANUAL CONTROL
	MAKE CONTACT DELAYED WHEN OPERATING
	BREAK CONTACT DELAYED WHEN RELEASING
	MAKE CONTACT DELAYED WHEN OPERATING AND RELEASING
	MAIN CONTACT OF A SWITCH DISCONNECTOR
	MAIN CONTACT OF A DISCONNECTOR

SYMBOL	DESCRIPTION
	MAIN CONTACT OF A CIRCUIT BREAKER
	PASSING MAKE CONTACT CLOSING MOMENTARILY DURING OPERATION AND RELEASE
	BREAK CONTACT DELAYED WHEN OPERATING
	MAKE CONTACT DELAYED WHEN RELEASING
	TWO MECHANICAL LINKS CROSSING WITHOUT CONNECTION
	JUNCTION OF MECHANICAL LINKS
	AUTOMATIC RESET
	NON-AUTOMATIC RESET
	SWITCHING DEVICE WITH MANUAL OPERATION AND WITH AUTOMATIC RESET
	SWITCHING DEVICE WITH MANUAL OPERATION AND WITH NON-AUTOMATIC RESET
	CHANGE-OVER SWITCHING DEVICE WITH MANUAL CONTROL AUTOMATIC RESET FROM POSITION 1-2 TO THE NEUTRAL POSITION
	RELAY WITH MAKE CONTACT
	RELAY WITH CHANGE-OVER CONTACT
	RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING
	RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING
	RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING AND RELEASING

SYMBOL	DESCRIPTION
	RELAY WITH TWO MAKE CONTACTS, ONE OF THEM DELAYED WHEN OPERATING
	RELAY WITH TWO ACTUATORS AND A TWO STABLE POSITIONS
	SIGNALLING LAMP
	MECHANICAL INDICATOR WITH AUTOMATIC RESET
	MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH AUTOMATIC RESET
	ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	RELAY WITH MECHANICAL INDICATOR
	ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND ONE OPERATED POSITION
	ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND TWO OPERATED POSITION
	BELL, BUZZER
	SIREN , HORN

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OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

GRAPHICAL SYMBOLS FOR DIAGRAMS

SAS INTERFACE PANEL +SAS I/F-3

S/S 8709 S-13656

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SYMBOL	DESCRIPTION
	FUSE / LINK
	FUSE WITH THE SUPPLY SIDE INDICATED
	SINGLE-PHASE TRANSFORMER WITH TWO SEPARATE WINDINGS (TWO ALTERNATIVE FORMS)
	SINGLE-PHASE TRANSFORMER WITH THREE SEPARATE WINDINGS (TWO ALTERNATIVE FORMS)
	SINGLE-PHASE TRANSFORMER WITH FERRO MAGNETIC CORE
	SINGLE-PHASE VOLTAGE TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION)
	SINGLE-PHASE VOLTAGE TRANSFORMER WITH TWO SECONDARY WINDINGS (MULTI-LINE AND SINGLE-LINE REPRESENTATION)
	CURRENT TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION)
	CURRENT TRANSFORMER WITH TWO CORES (MULIT-LINE AND SINGLE-LINE REPRESENTATION)
	CURRENT TRANSFORMER WITH TWO SECONDARY WINDINGS ON ONE CORE (MULTI-LINE AND SINGLE-LINE REPRESENTATION)
	FILTER
	HIGH-PASS FILTER
	BAND-PASS FILTER
V	VOLTMETER
A	AMMETER

SYMBOL	DESCRIPTION
W	WATTMETER
Var	VARMETER
PF	POWER FACTOR METER
	POSITION INDICATOR
	SYNCHROSCOPE
V	RECORDING VOLTMETER
W	RECORDING WATTMETER
h	HOUR METER
Wh	WATT-HOUR METER
Wh	WATT-HOUR METER FOR ENERGY FROM A BUSBAR SYSTEM
	ELEMENT WITH STATIC INPUT
	ELEMENT WITH STATIC NEGATED INPUT
	ELEMENT WITH STATIC NEGATED OUTPUT
>	ELEMENT WITH DYNAMIC INPUT
>	ELEMENT WITH DYNAMIC NEGATED INPUT
	ELEMENT WITH INHIBITING INPUT

SYMBOL	DESCRIPTION
	ELEMENT WITH NEGATED INHIBITING INPUT
	ELEMENT WITH INPUT WHICH DOES NOT CARRY ANY LOGIC INFORMATION
X]	ELEMENT WITH POSTPONED OUTPUT
&	AND-ELEMENT WITH TWO INPUTS
≥1	OR-ELEMENT WITH TWO INPUTS
≥2	LOGIC THRESHOLD ELEMENT WITH FOUR INPUTS AND THRESHOLD VALUE 2
=2	ELEMENT WITH THREE INPUTS FOR "2 AND ONLY 2"
=1	EXCLUSIVE OR-ELEMENT WITH THREE INPUTS
=	LOGIC IDENTITY ELEMENT WITH THREE INPUTS
>n/2	MAJORITY ELEMENT WITH THREE INPUTS
1	NEGATOR
&	NAND ELEMENT WITH TWO INPUTS
≥1	NOR ELEMENT WITH TWO INPUTS
X Y	BISTABLE ELEMENT

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OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

GRAPHICAL SYMBOLS FOR DIAGRAMS

SAS INTERFACE PANEL +SAS I/F-3

S/S 8709 S-13656

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LEGENDS

±R1	DC SUPPLY - MAIN PROTECTION
±R2	DC SUPPLY - SECONDARY PROTECTION
±R3	DC SUPPLY - BACK UP PROTECTION
±IT	DC SUPPLY - INTER TRIP
FL	DC SUPPLY - FLASHING CIRCUIT
BB RS±	DC SUPPLY - BUS BAR - PROTECTION RESET
BB CBF±/CBF±	DC SUPPLY - CBF PROTECTION
R	RESET BUS - ALARM SYSTEM
CR	CONTROL ROOM
ECC	ENERGY CONTROL CENTRE
LOCAL	THE LOCATION OF CONTROLLED DEVICE
REMOTE	ANY OTHER LOCATION NOT LOCAL
ON	CB NORMALLY OPEN AUXILIARY CONTACT
OFF	CB NORMALLY CLOSED AUXILIARY CONTACT
A	COMMON
T	TEST POSITION
S	SERVICE POSITION
CS	CLOSE IN SERVICE POSITION
CT	CLOSE IN TEST POSITION
LS	LOCAL SERVICE
LT	LOCAL TEST
LC	LOCAL CLOSE
LO	LOCAL OPEN
RO	REMOTE OPEN

NOTES

LABELS

WHITE LABEL WITH BLACK LETTERING WILL BE PROVIDED FOR ALL MOUNTED APPARATUS EQUIPMENT IDENTIFICATION AND FUNCTION REFERENCE LABEL WILL BE PROVIDED FOR FRONT MOUNTED EQUIPMENTS OF THE PANEL AND EQUIPMENT IDENTIFICATION LABEL WILL BE PROVIDED FOR INTERNALLY MOUNTED EQUIPMENTS

WIRING

PVC INSULATED 600V GRADE
2.5 SQ.mm. YELLOW COLOURED FOR CT CIRCUITS
2.5 SQ.mm. RE COLOURED FOR VT CIRCUITS
1.5 SQ.mm. GREY COLOURED FOR DC SUPPLY, SCADA AND CONTROL CIRCUITS
1.5 SQ.mm. BLUE COLOURED FOR COMMON ALARM SIGNALS
2.5 SQ.mm. BLACK COLOURED FOR AVC AND AC CIRCUITS
2.5 SQ.mm. YELLOW/GREEN COLOURED FOR EARTHING CONNECTIONS
FOLLOWING MARKERS SHALL BE PROVIDED ON FOLLOWING WIRES:
+ SIGN FOR DC + WIRE
- SIGN FOR DC - WIRE

LUGS

A. CT CIRCUITS- RING TYPE
B. OTHER CIRCUITS - SPADE TYPE

FERULLING

YELLO TUBE 3.2 mm FOR 1.5SQ mm WIRES AND 4.2 FOR 2.5 SQ mm WIRES
(AS PER 31 - TMSS-1, RE.0)

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COMMON LEGENDS
SAS INTERFACE PANEL +SAS I/F-3
S/S 8709 S-13656
RIYADH SAUDI ARABIA

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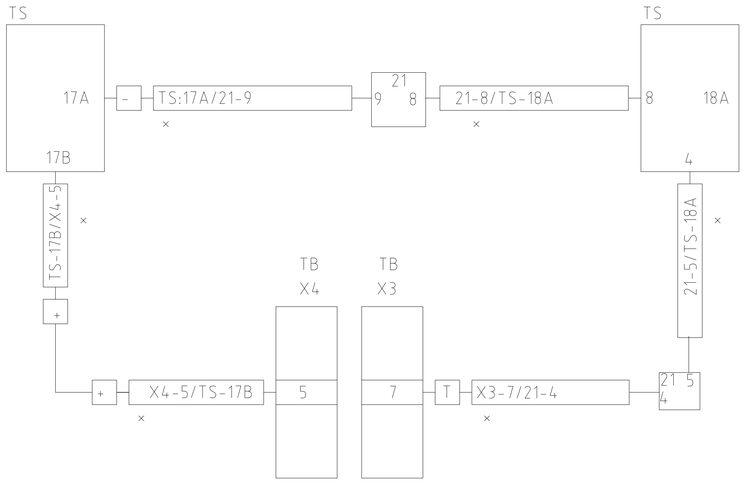
FOR 132kV RELAY & CONTROL, PROTN. PANELS



AS PER IEC-391 FIG 14a (W/O SUPPLEMENTARY/IDENTIFICATION MARK)

NOTE:1 ADDITIONAL MARKING AS APPLICABLE

NOTE:2 FERRULE NUMBERING WILL BE BLACK LETTERS ON YELLOW TUBE

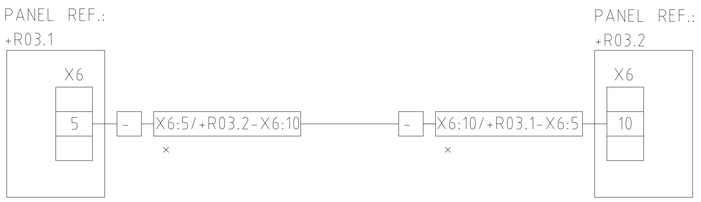
3.2 mm for 1.5 sq mm wires and

4.2 mm for 2.5 sq mm wires

(As per 31-TMSS-1, REV 0)

NOTE:3 STARTING POINT OF THE FERRULE LEFT TO RIGHT

FOR 132kV PANELS INTERPANEL WIRING



AS PER IEC-391 FIG 14d (W/O SUPPLEMENTARY/IDENTIFICATION MARK)

WIRES - PVC insulated,stranded, coaled annealed copper conductor graded for 1000V	a. CT Circuits - 2.5 Sqmm PVC Yellow colour
	b. VT Circuits - 2 Sqmm PVC Red colour
	c. DC, & CONTROL Circuits - 1.5 Sqmm PVC Grey colour
	d. Alarm Circuits - 1.5 Sqmm PVC Blue colour
	e. AVC & AC Circuits - 2.5 Sqmm PVC Black colour
	f. Earth Circuits - 2.5 Sqmm PVC Yellow/Green colour
LUGS - Pre-Insulated	a(CT Circuits - Ring type
	b(Other Circuits - Spade type

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FERRULE AND WIRING DETAILS

SAS INTERFACE PANEL +SAS I/F-3

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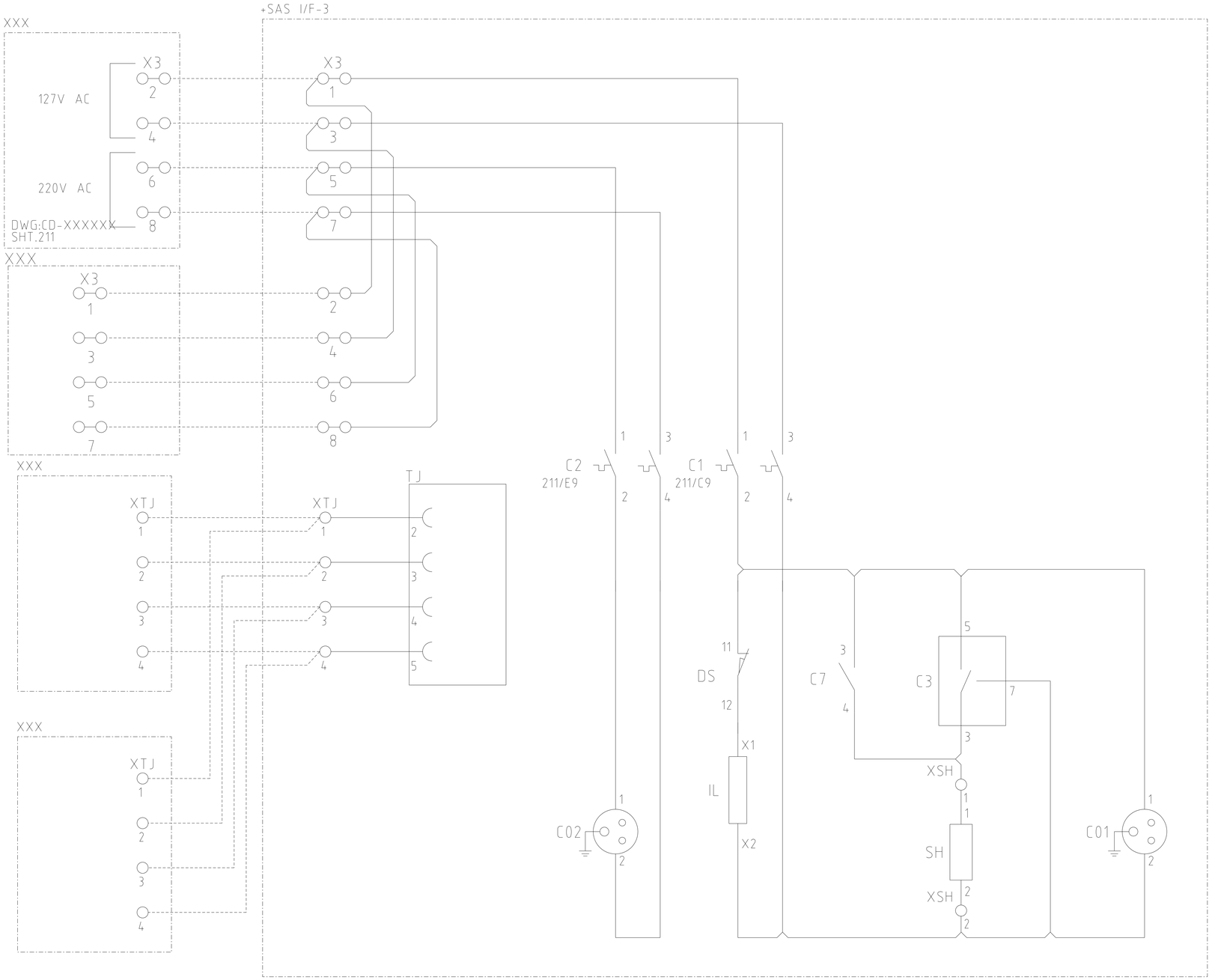

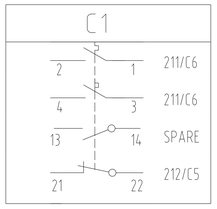

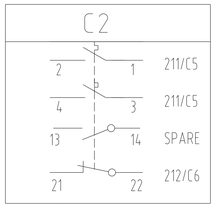

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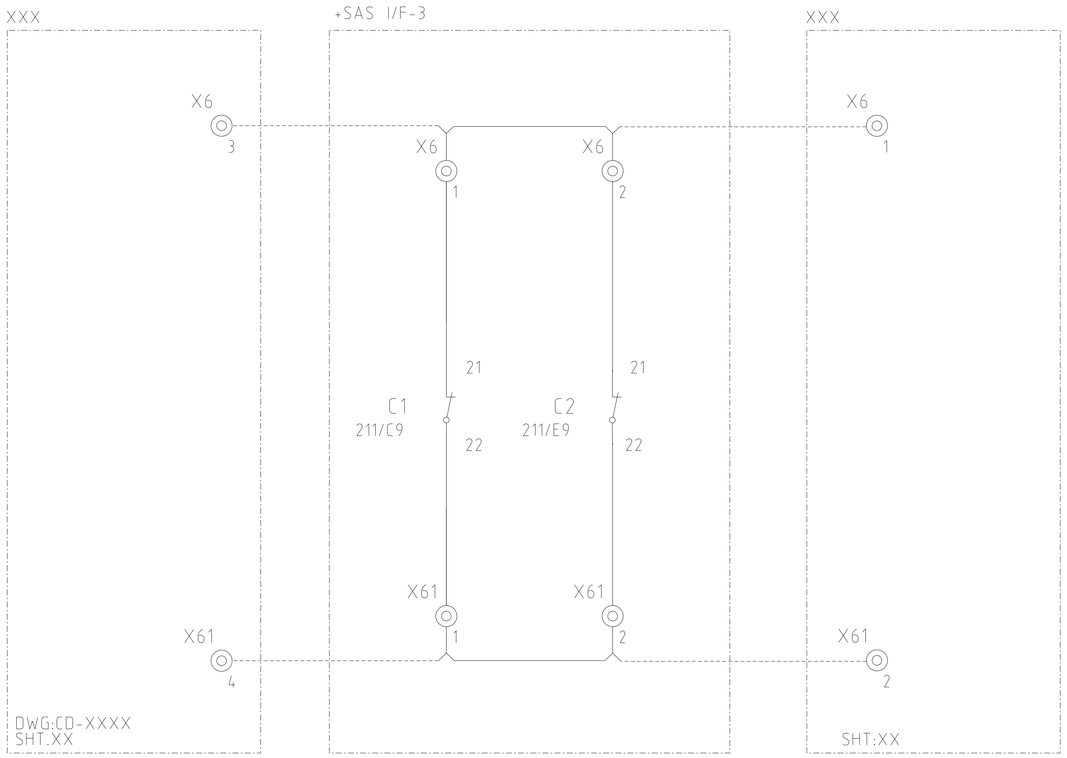

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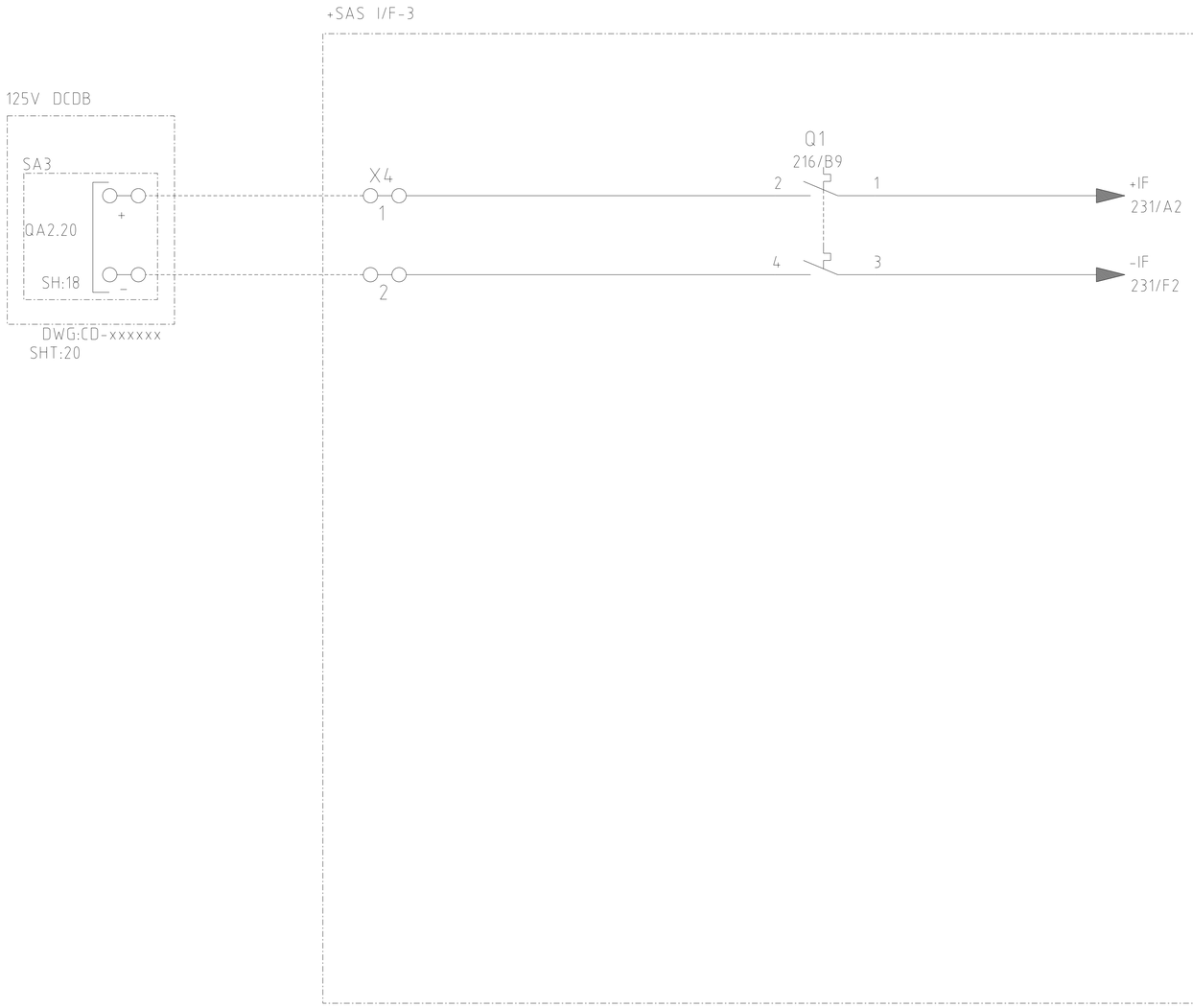

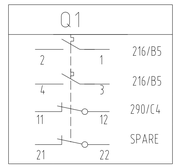

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DC SUPPLY DISTRIBUTION

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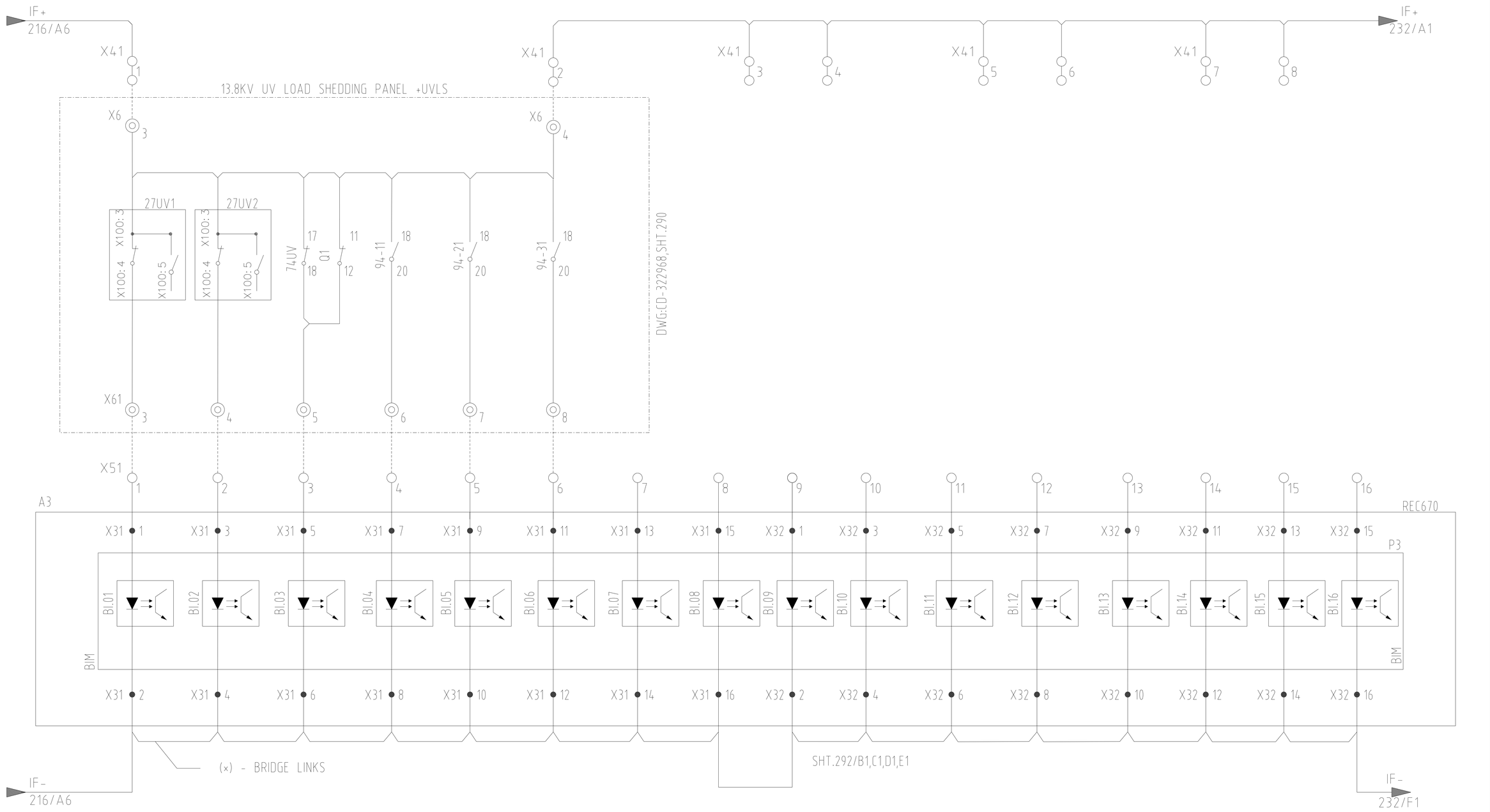
13.8KV UV LOAD SHEDDING PANEL +UVLS						
27UV1	27UV2	DC SUPPLY	U/V	U/V	U/V	
FAULTY	FAULTY	FAULTY	STG-1 OPTD.	STG-2 OPTD.	STG-3 OPTD.	SPARE



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STATION INTERFACE PANEL BINARY INPUTS
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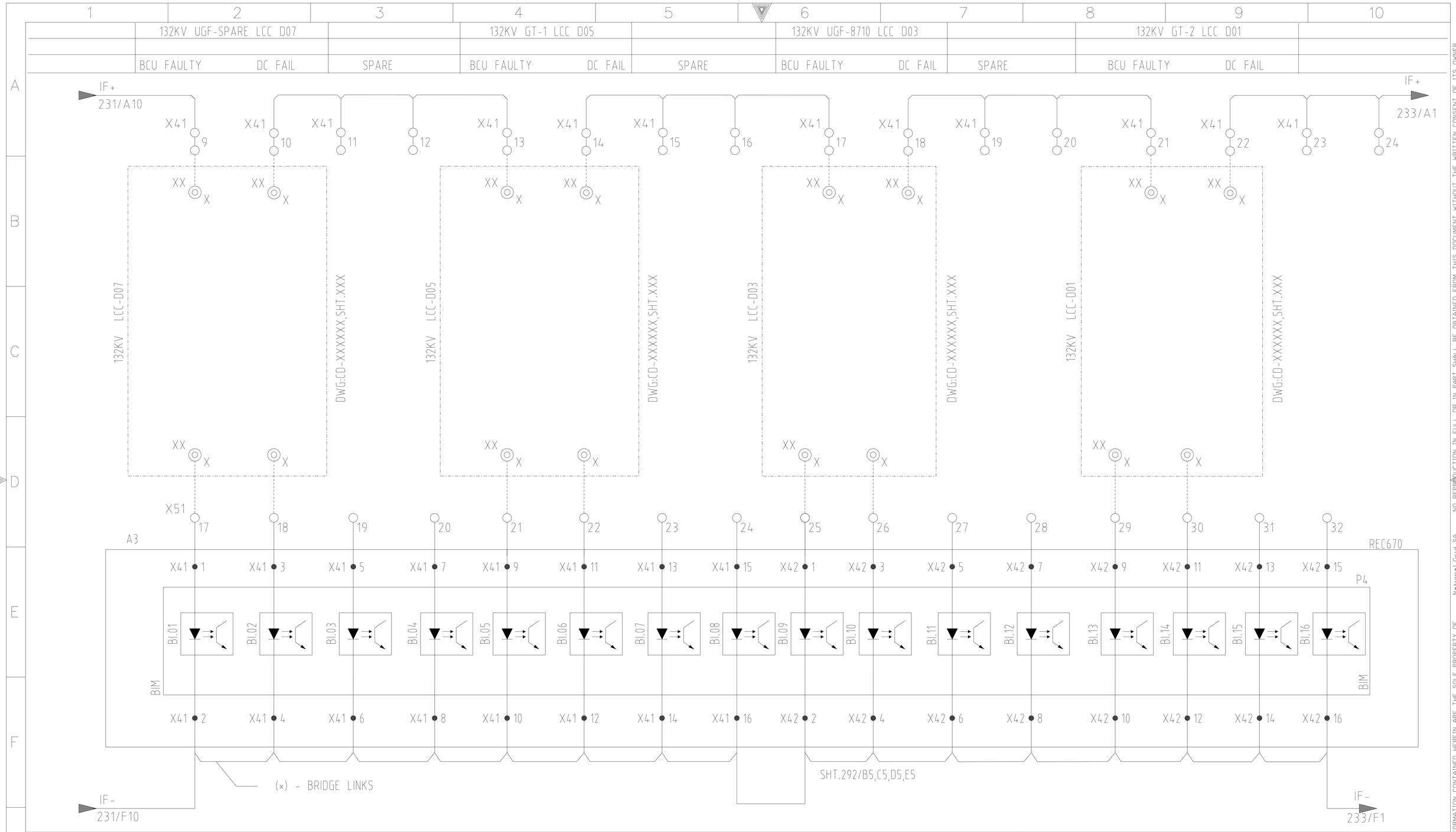

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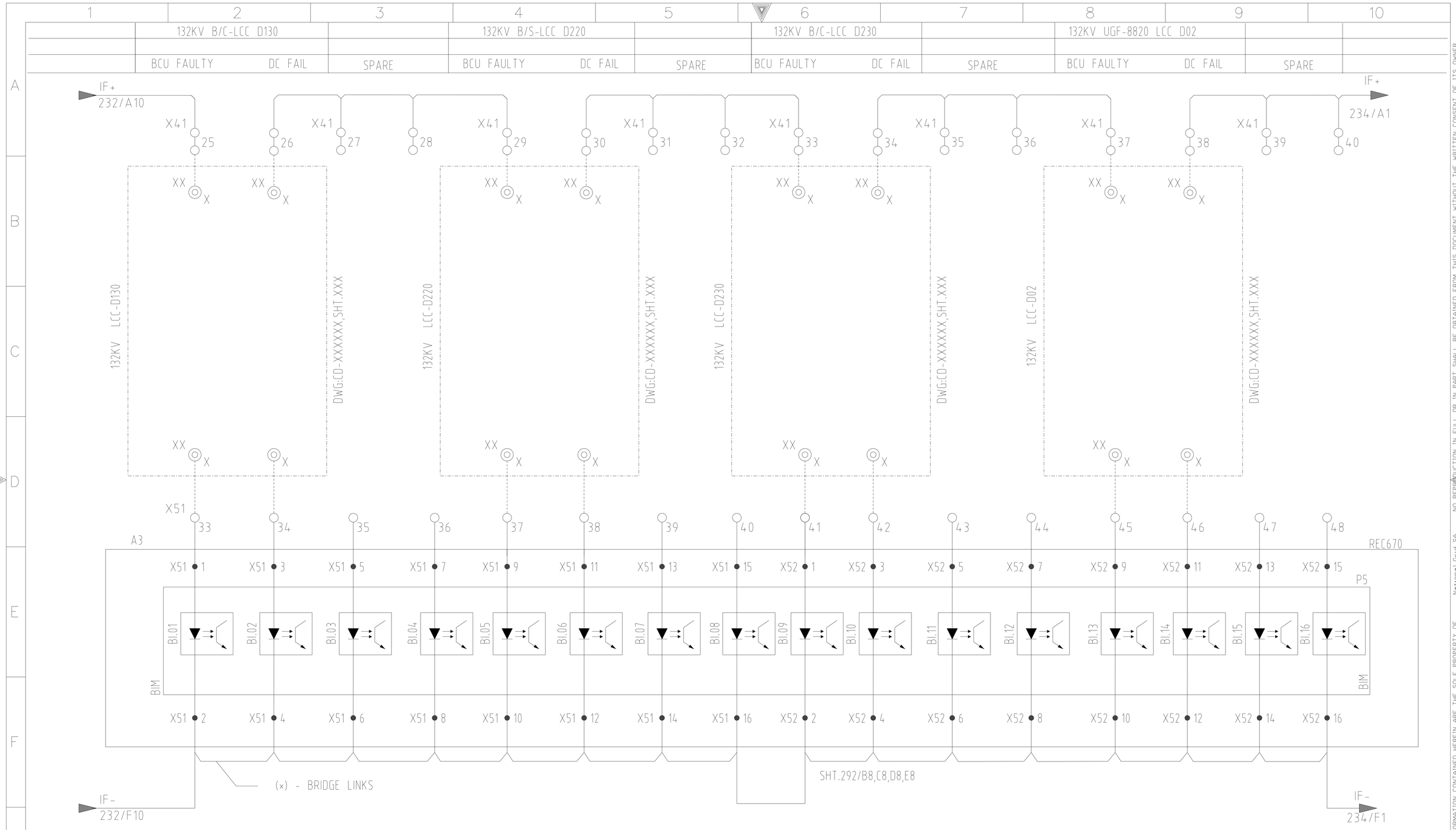

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STATION INTERFACE PANEL BINARY INPUTS

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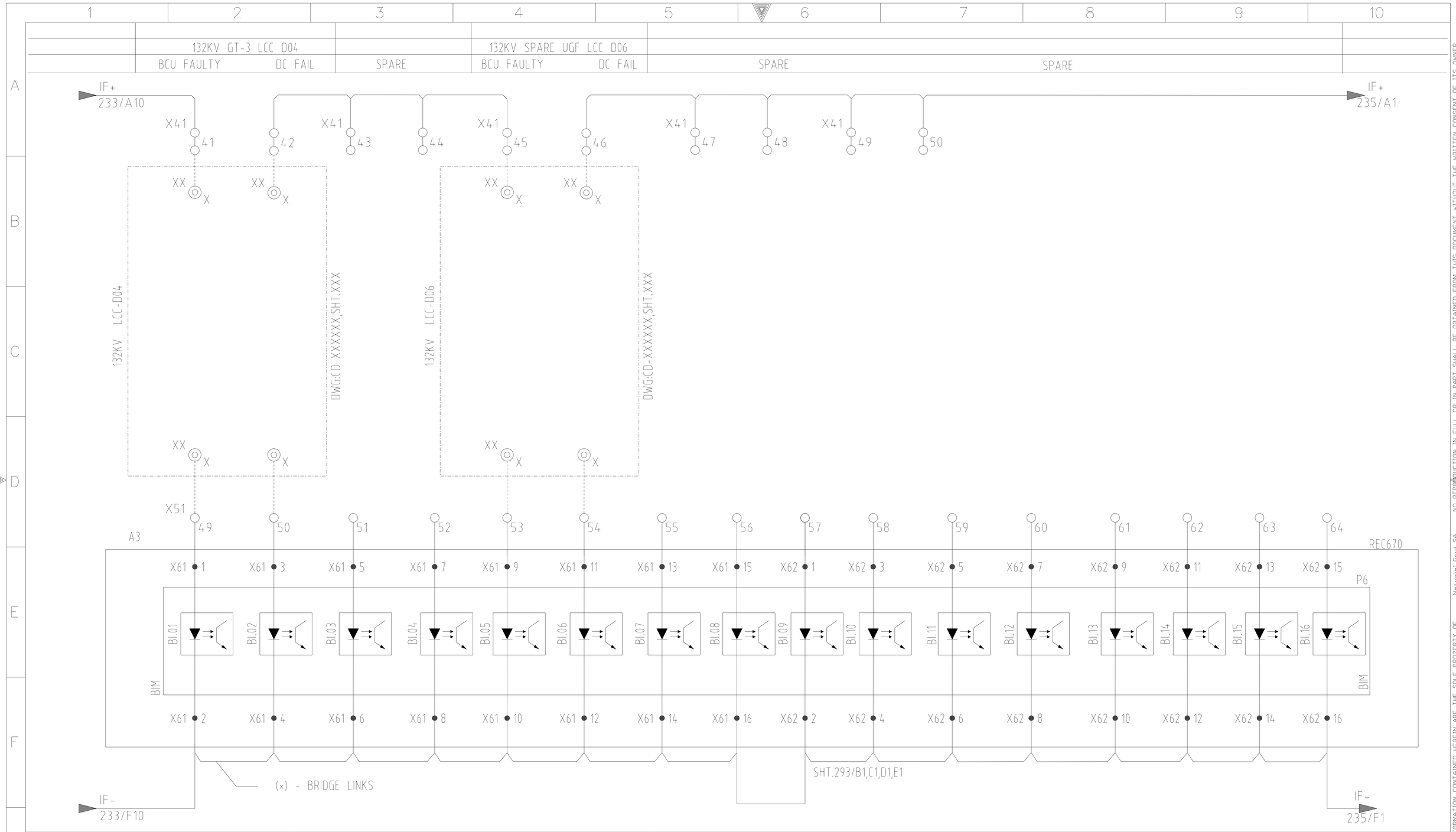

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STATION INTERFACE PANEL BINARY INPUTS

SAS INTERFACE PANEL +SAS I/F-3

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RIYADH SAUDI ARABIA

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نقل الكهرباء
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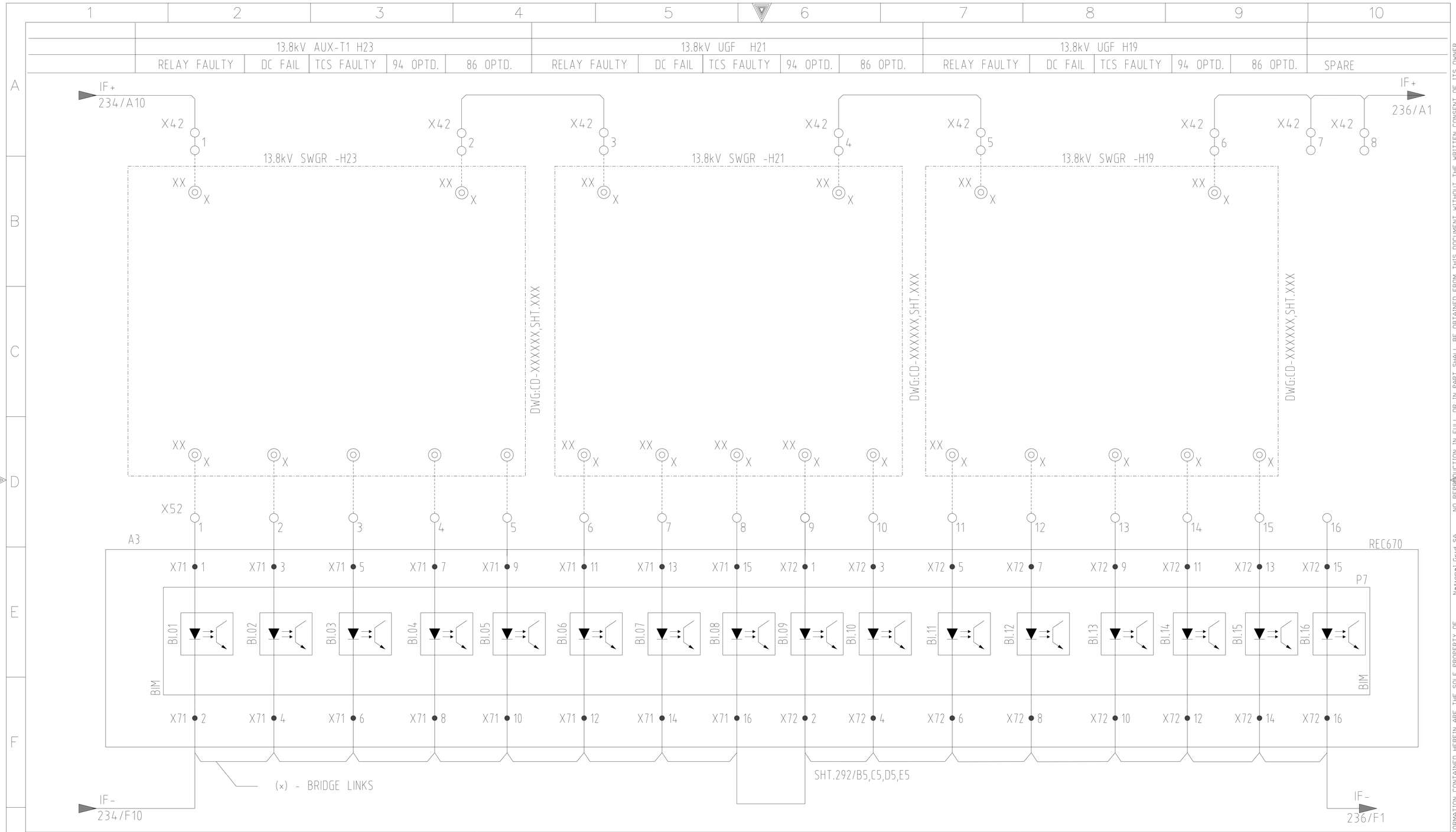

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OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

STATION INTERFACE PANEL BINARY INPUTS

SAS INTERFACE PANEL +SAS I/F-3

S/S 8709 S-13656

RIYADH SAUDI ARABIA

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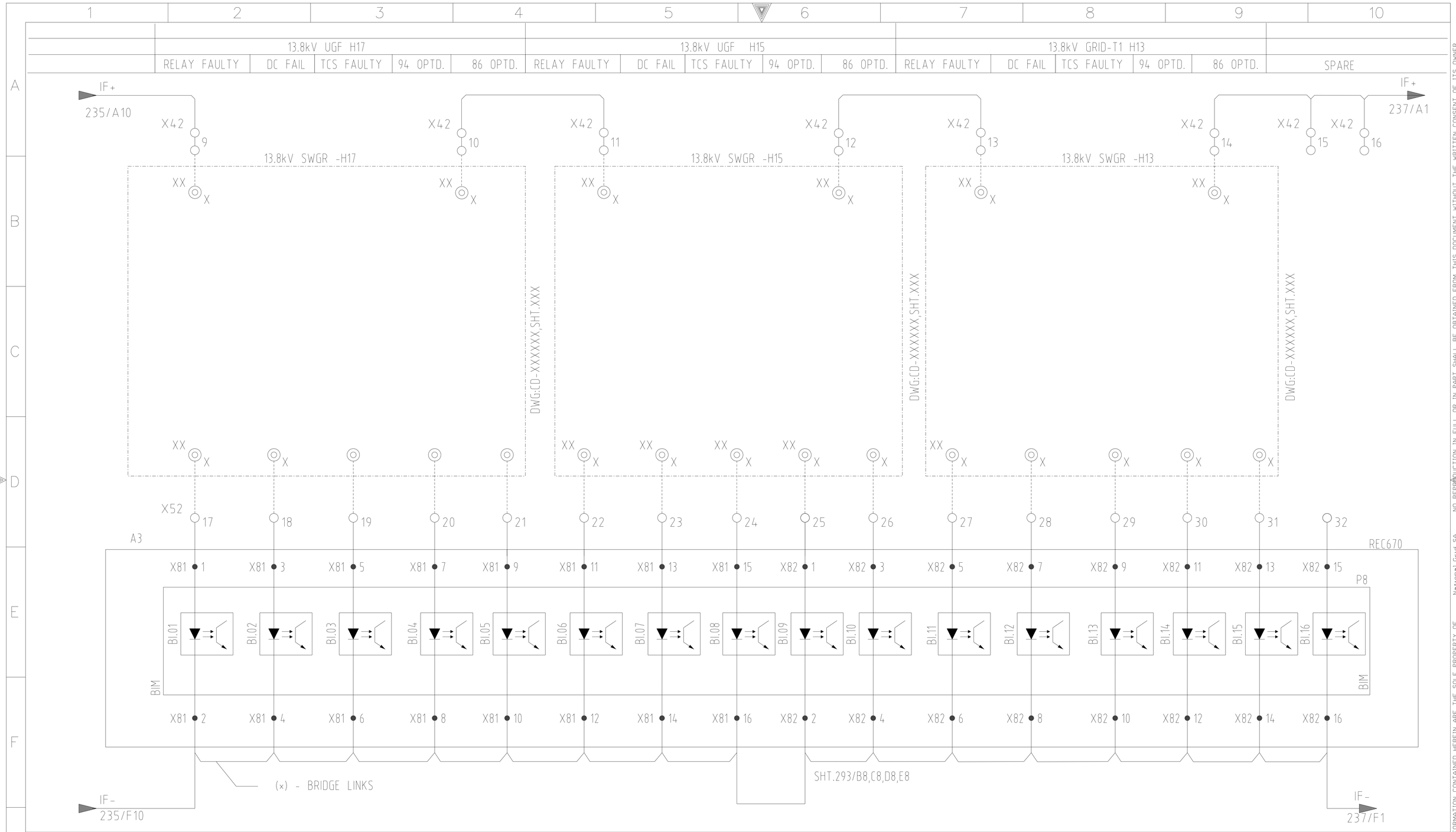

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			RIYADH	SAUDI ARABIA

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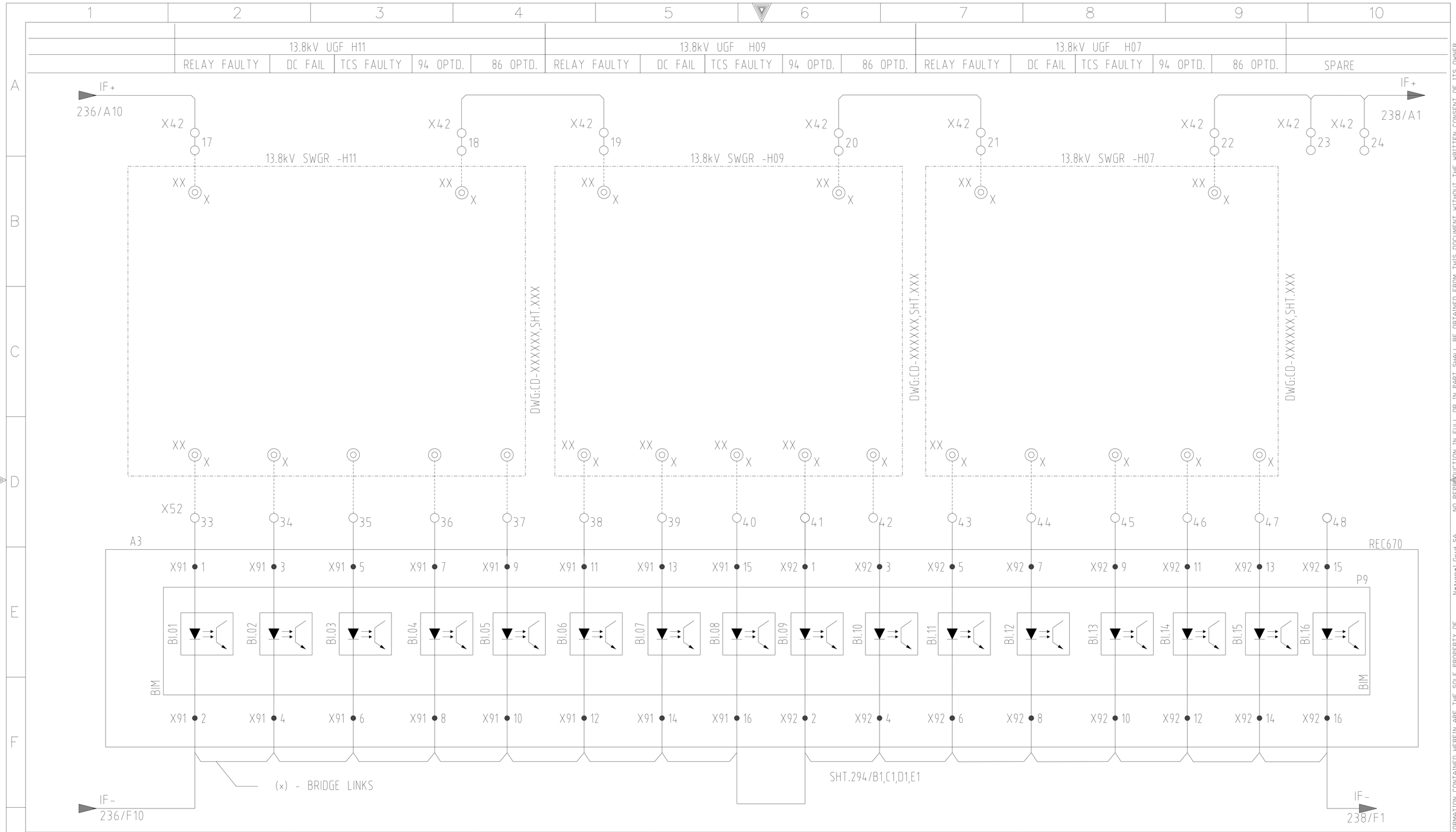

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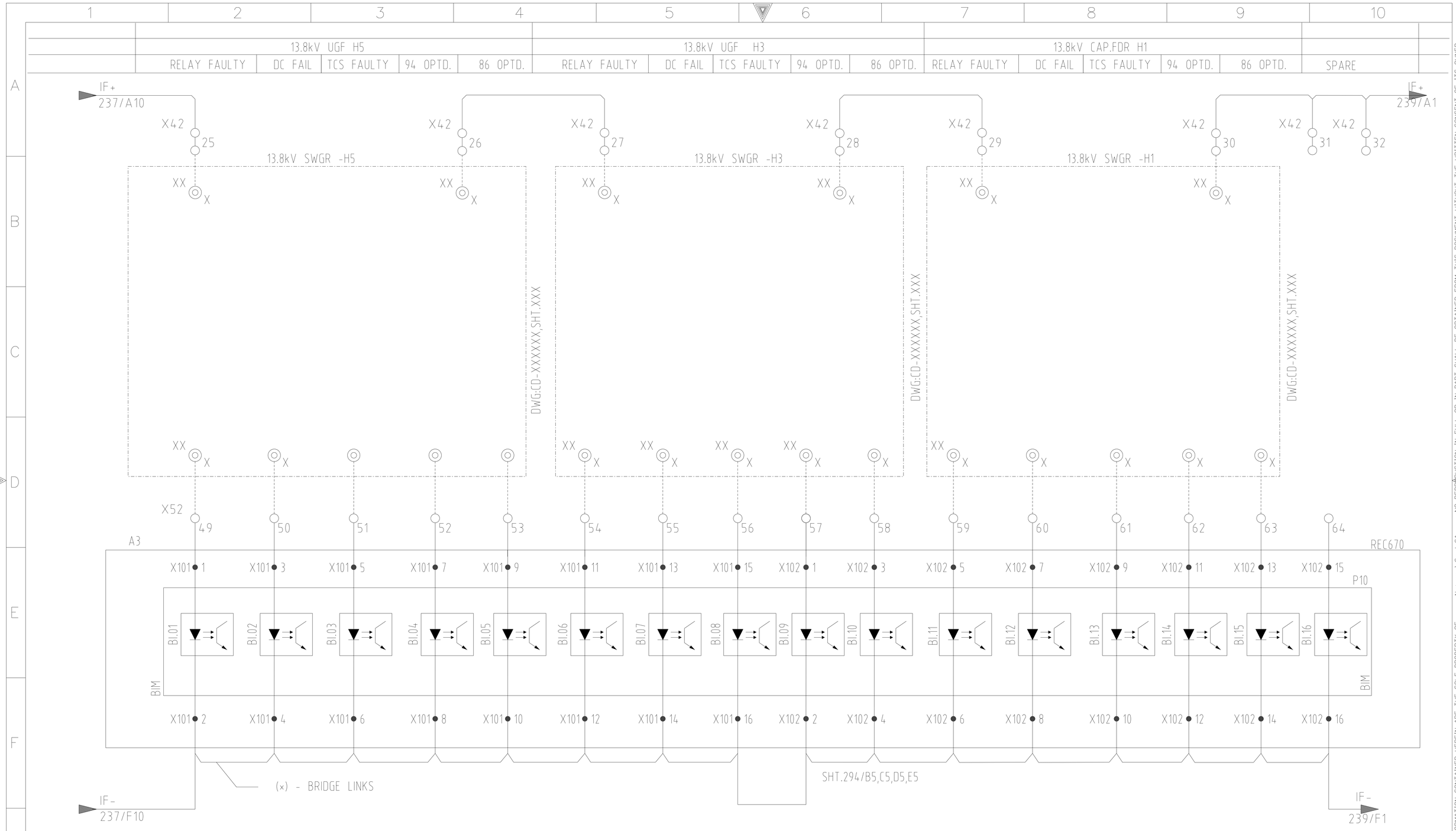

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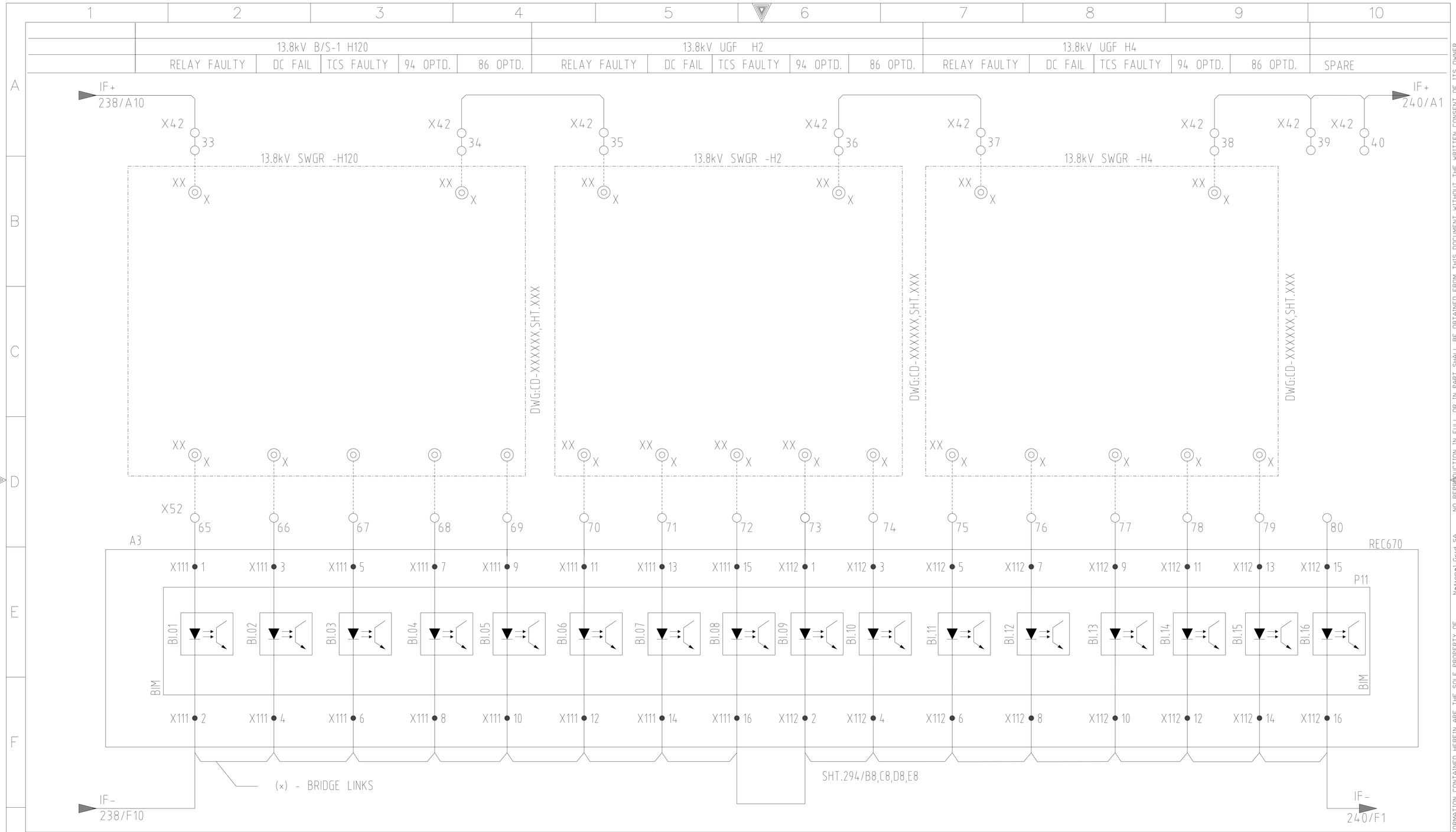

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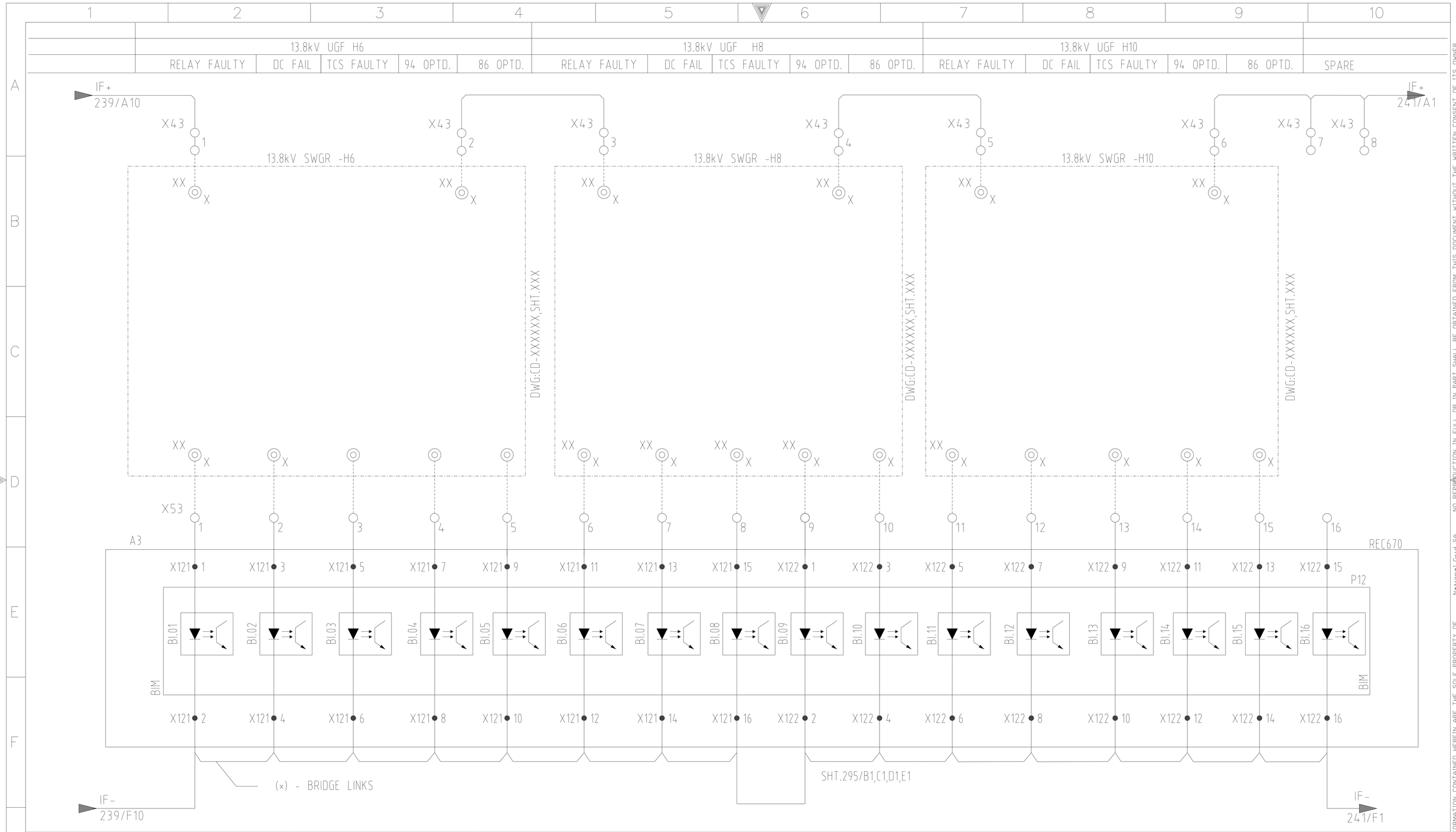

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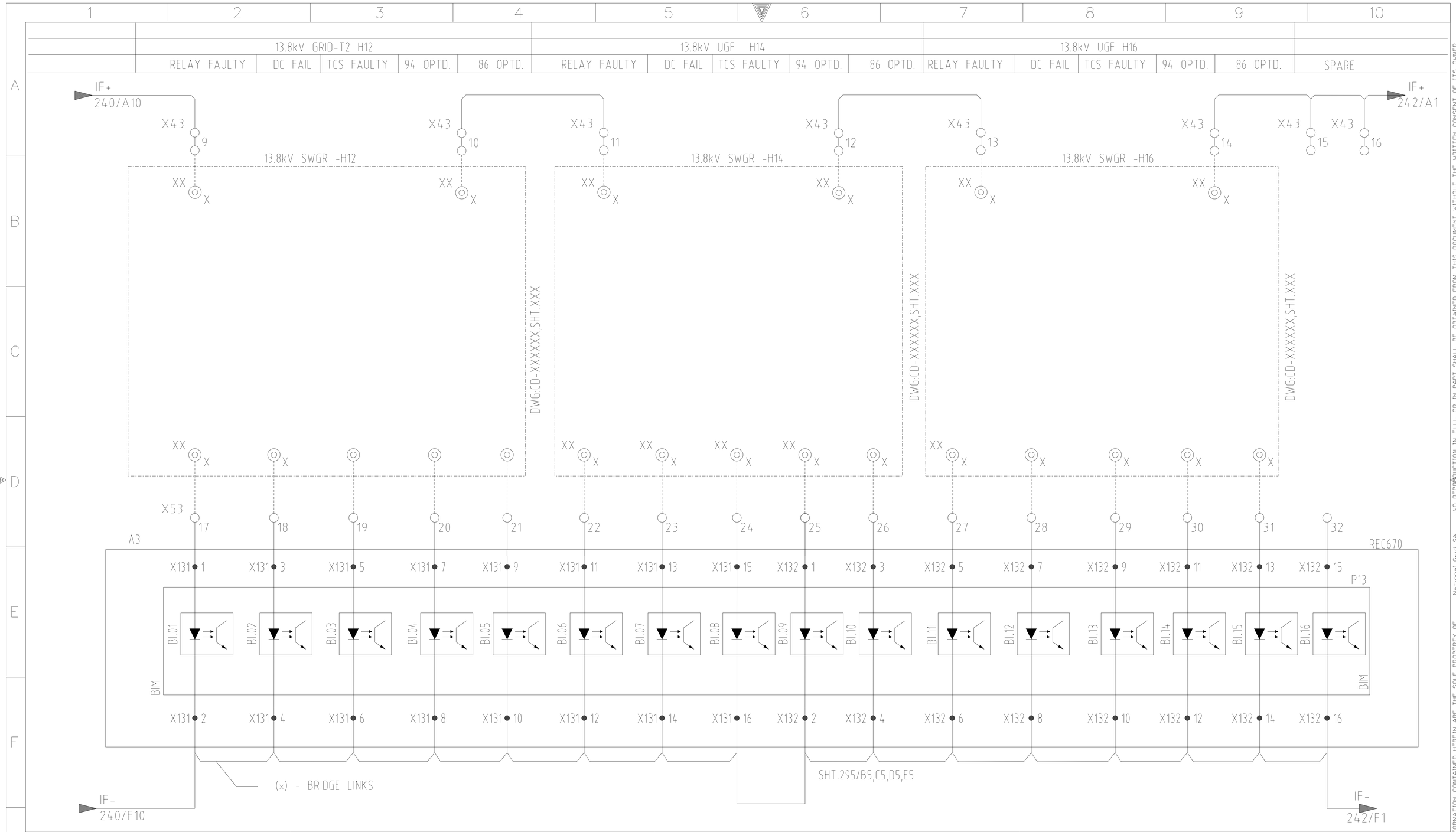

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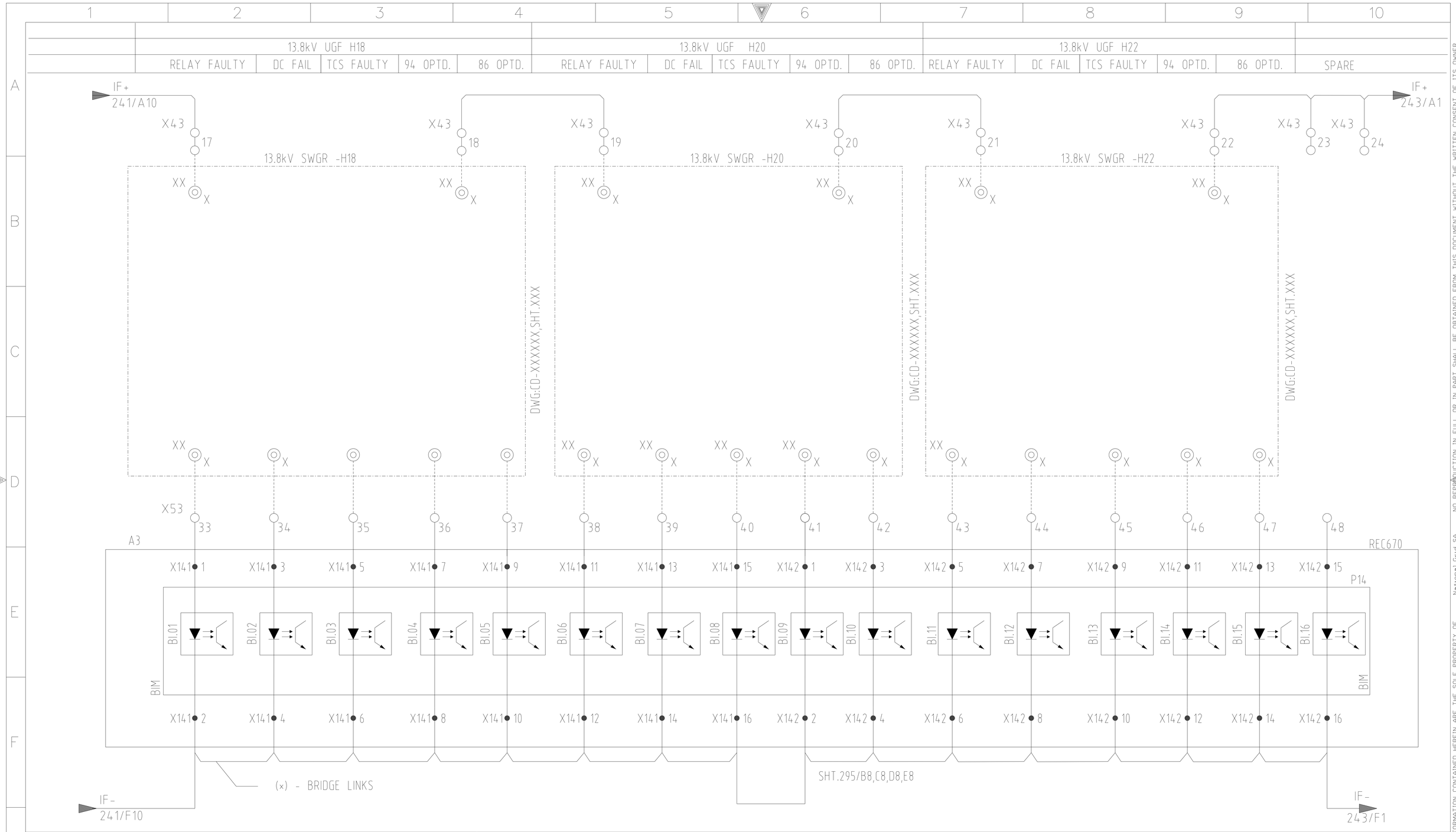

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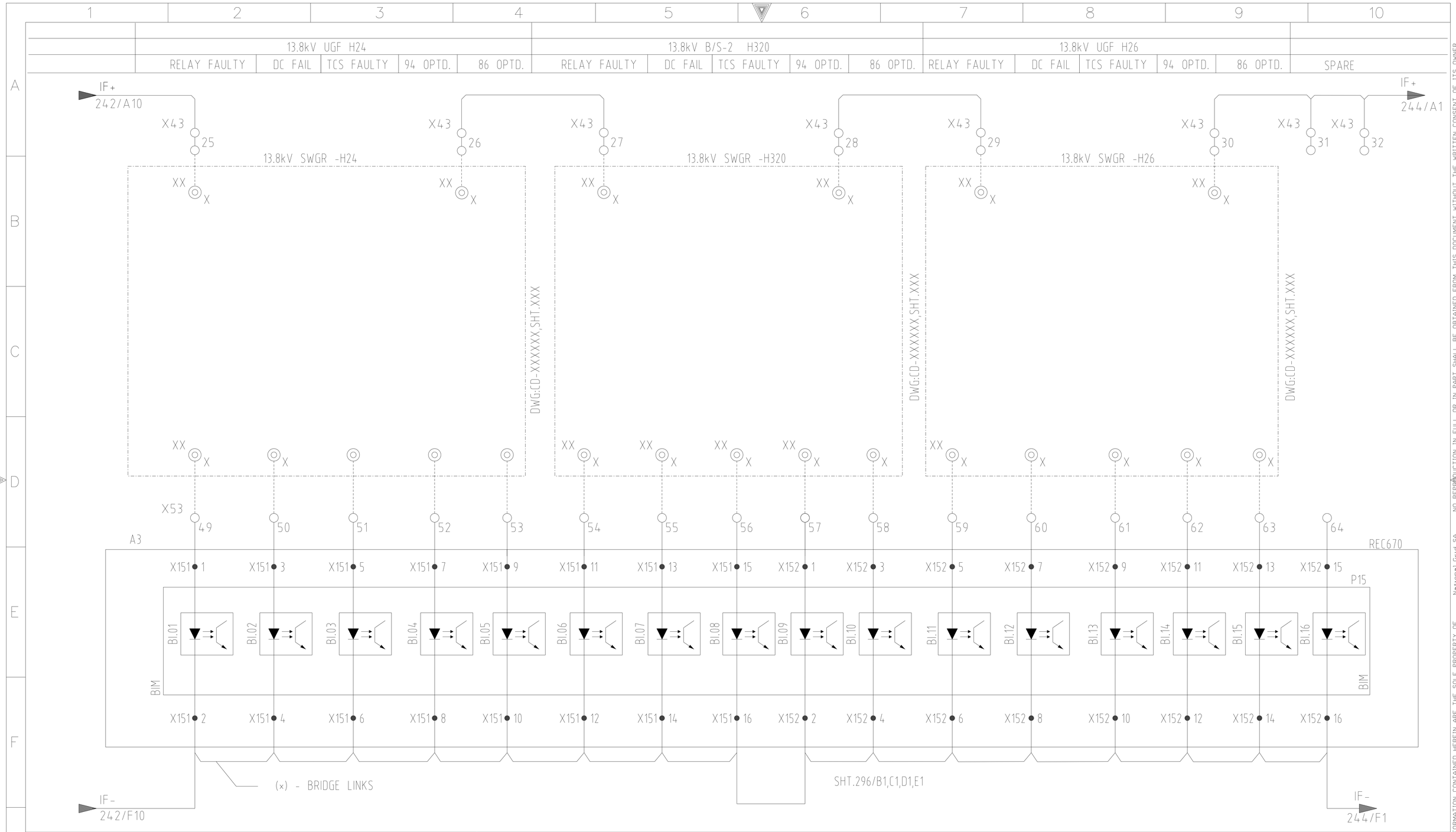

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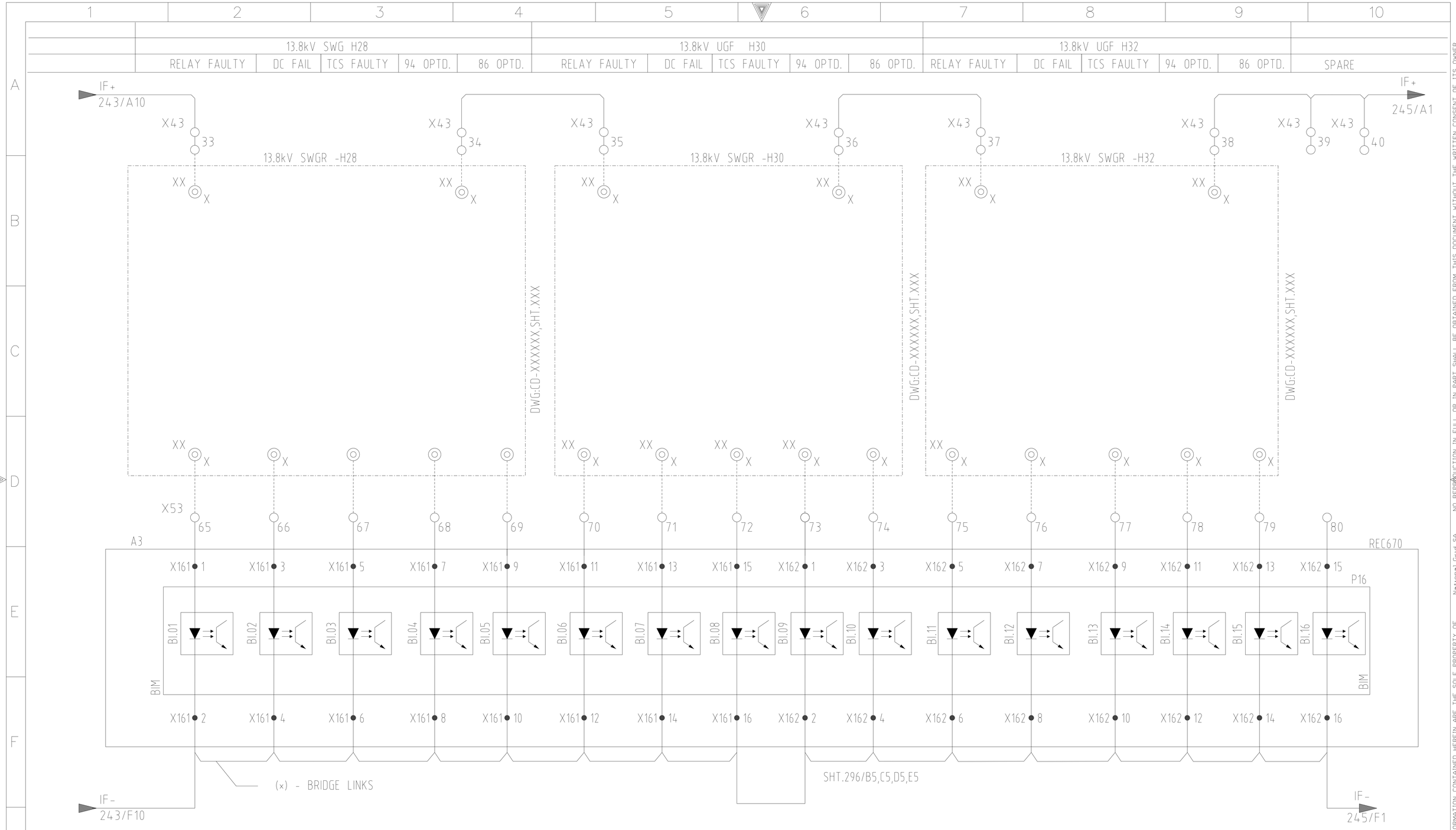

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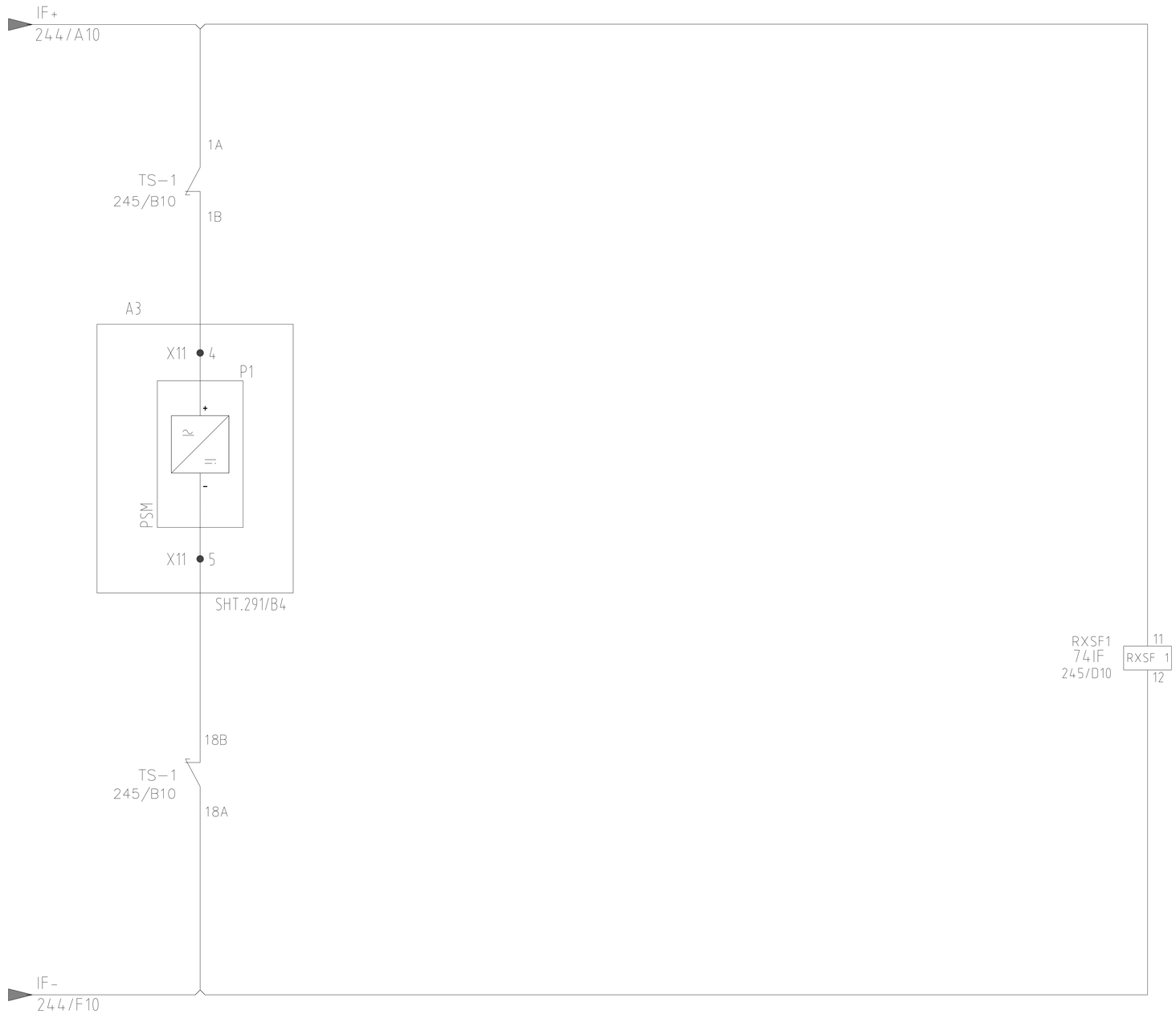
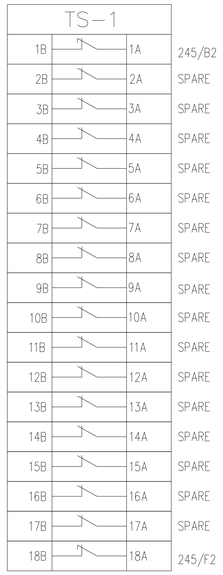
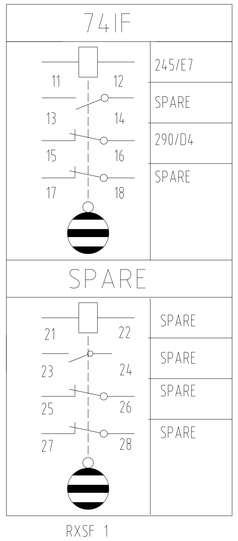
A3 — IF DC SUPPLY

POWER SUPPLY — SUPERVISION







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DC SUPERVISION CIRCUIT

SAS INTERFACE PANEL +SAS I/F-3

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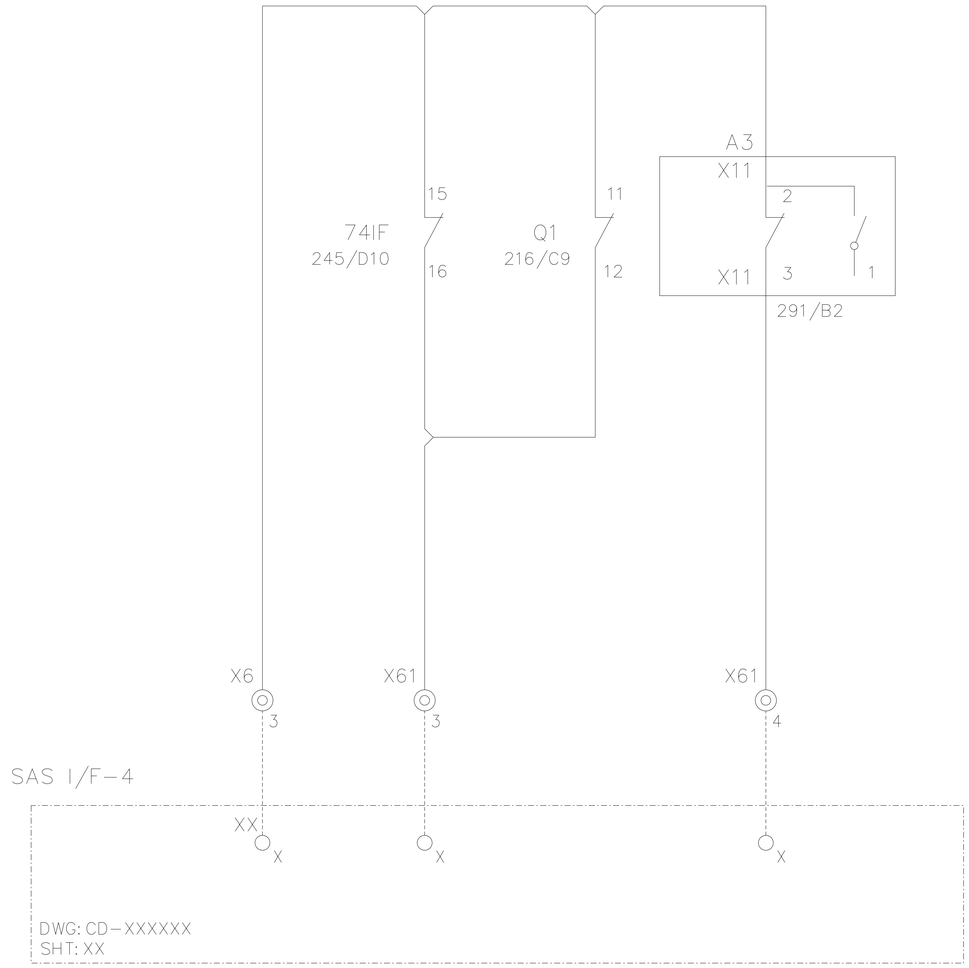
IF SUPPLY FAILED	SCMS FAILED



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COMMON ALARM CIRCUITS

SAS INTERFACE PANEL +SAS I/F-3

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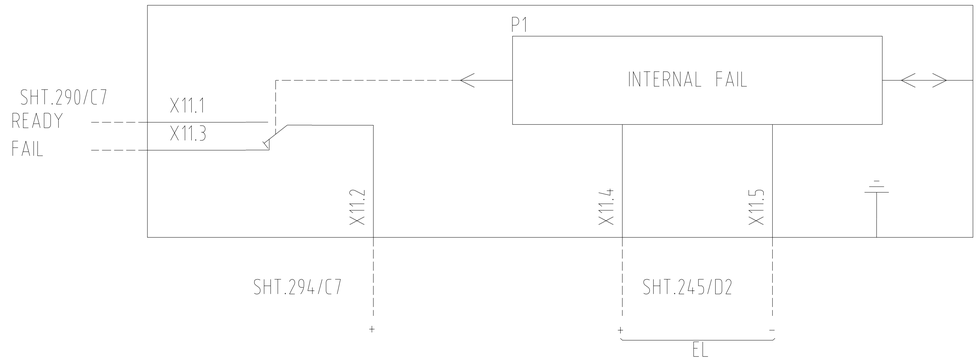
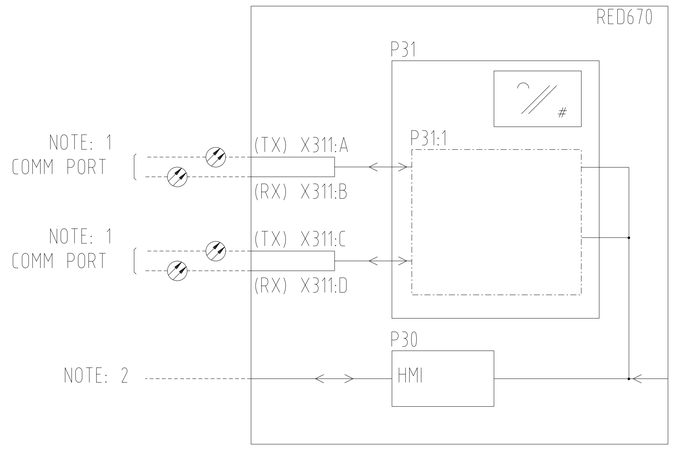
A3

POWER SUPPLY MODULE (PSM)





ABBREVIATIONS

TRM	TRANSFORMER INPUT MODULE
ADM	A/D CONVERSION MODULE
PSM	POWER SYPPLY MODULE
IOM	BINARY IN/OUT MODULE
BOM	BINARY OUTPUT MODULE
HMI	HUMAN MACHINE INTERFACE
BIM	BINARY INPUT MODULE

USED FOR TRIP ISOLATION (RTXP-24)

USED FOR VOLTAGE (RTXP-24)

USED FOR CT ISOLATION (RTXP-24)

NOTE:

1. OPTICAL ETHERNET MODULE 2 GLASS INTERFACES - IEC 61850
2. FRONT COMMUNICATION PORT, ETHERNET, RJ45 CONNECTORL

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BLOCK REFERENCE

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A3

BINARY INPUT CARD

A3 — BIM P3 REC670 — LOCATION=P3 — PLANT ADAPTED CONFIGURATION

SHT.231/D1 TO D10

	X31	
1	BI.01	
2		
3	BI.02	
4		
5	BI.03	
6		
7	BI.04	
8		
9	BI.05	
10		
11	BI.06	
12		
13	BI.07	
14		
15	BI.08	
16		

	X32	
1	BI.09	
2		
3	BI.10	
4		
5	BI.11	
6		
7	BI.12	
8		
9	BI.13	
10		
11	BI.14	
12		
13	BI.15	
14		
15	BI.16	
16		

A3 — BIM P4 REC670 — LOCATION=P4 — PLANT ADAPTED CONFIGURATION

SHT.232/D1 TO D10

	X41	
1	BI.01	
2		
3	BI.02	
4		
5	BI.03	
6		
7	BI.04	
8		
9	BI.05	
10		
11	BI.06	
12		
13	BI.07	
14		
15	BI.08	
16		

	X42	
1	BI.09	
2		
3	BI.10	
4		
5	BI.11	
6		
7	BI.12	
8		
9	BI.13	
10		
11	BI.14	
12		
13	BI.15	
14		
15	BI.16	
16		

A3 — BIM P5 REC670 — LOCATION=P5 — PLANT ADAPTED CONFIGURATION

SHT.233/D1 TO D10

	X51	
1	BI.01	
2		
3	BI.02	
4		
5	BI.03	
6		
7	BI.04	
8		
9	BI.05	
10		
11	BI.06	
12		
13	BI.07	
14		
15	BI.08	
16		

	X52	
1	BI.09	
2		
3	BI.10	
4		
5	BI.11	
6		
7	BI.12	
8		
9	BI.13	
10		
11	BI.14	
12		
13	BI.15	
14		
15	BI.16	
16		

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A3

BINARY INPUT CARD

A3 — BIM P6 — REC670 — LOCATION=P6 — PLANT ADAPTED CONFIGURATION

SHT.234/D1 TO D10

X61	1	BI.01
	2	
	3	BI.02
	4	
	5	BI.03
	6	
	7	BI.04
	8	
	9	BI.05
	10	
	11	BI.06
	12	
	13	BI.07
	14	
	15	BI.08
	16	
X62	1	BI.09
	2	
	3	BI.10
	4	
	5	BI.11
	6	
	7	BI.12
	8	
	9	BI.13
	10	
	11	BI.14
	12	
	13	BI.15
	14	
	15	BI.16
	16	

A3 — BIM P7 — REC670 — LOCATION=P7 — PLANT ADAPTED CONFIGURATION

SHT.235/D1 TO D10

X71	1	BI.01
	2	
	3	BI.02
	4	
	5	BI.03
	6	
	7	BI.04
	8	
	9	BI.05
	10	
	11	BI.06
	12	
	13	BI.07
	14	
	15	BI.08
	16	
X72	1	BI.09
	2	
	3	BI.10
	4	
	5	BI.11
	6	
	7	BI.12
	8	
	9	BI.13
	10	
	11	BI.14
	12	
	13	BI.15
	14	
	15	BI.16
	16	

A3 — BIM P8 — REC670 — LOCATION=P8 — PLANT ADAPTED CONFIGURATION

SHT.236/D1 TO D10

X81	1	BI.01
	2	
	3	BI.02
	4	
	5	BI.03
	6	
	7	BI.04
	8	
	9	BI.05
	10	
	11	BI.06
	12	
	13	BI.07
	14	
	15	BI.08
	16	
X82	1	BI.09
	2	
	3	BI.10
	4	
	5	BI.11
	6	
	7	BI.12
	8	
	9	BI.13
	10	
	11	BI.14
	12	
	13	BI.15
	14	
	15	BI.16
	16	

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A3 — BIM P9 — REC670 — LOCATION=P9 — PLANT ADAPTED CONFIGURATION

SHT.237/D1 TO D10

	X91	
1	BI.01	
2		
3	BI.02	
4		
5	BI.03	
6		
7	BI.04	
8		
9	BI.05	
10		
11	BI.06	
12		
13	BI.07	
14		
15	BI.08	
16		

	X92	
1	BI.09	
2		
3	BI.10	
4		
5	BI.11	
6		
7	BI.12	
8		
9	BI.13	
10		
11	BI.14	
12		
13	BI.15	
14		
15	BI.16	
16		

A3 — BIM P10 — REC670 — LOCATION=P10 — PLANT ADAPTED CONFIGURATION

SHT.238/D1 TO D10

	X101	
1	BI.01	
2		
3	BI.02	
4		
5	BI.03	
6		
7	BI.04	
8		
9	BI.05	
10		
11	BI.06	
12		
13	BI.07	
14		
15	BI.08	
16		

	X102	
1	BI.09	
2		
3	BI.10	
4		
5	BI.11	
6		
7	BI.12	
8		
9	BI.13	
10		
11	BI.14	
12		
13	BI.15	
14		
15	BI.16	
16		

A3 — BIM P11 — REC670 — LOCATION=P11 — PLANT ADAPTED CONFIGURATION

SHT.239/D1 TO D10

	X111	
1	BI.01	
2		
3	BI.02	
4		
5	BI.03	
6		
7	BI.04	
8		
9	BI.05	
10		
11	BI.06	
12		
13	BI.07	
14		
15	BI.08	
16		

	X112	
1	BI.09	
2		
3	BI.10	
4		
5	BI.11	
6		
7	BI.12	
8		
9	BI.13	
10		
11	BI.14	
12		
13	BI.15	
14		
15	BI.16	
16		

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A3 — BIM P12 — REC670 — LOCATION=P12 — PLANT ADAPTED CONFIGURATION

SHT.240/D1 TO D10

X121	1	BI.01
	2	
	3	BI.02
	4	
	5	BI.03
	6	
	7	BI.04
	8	
	9	BI.05
	10	
	11	BI.06
	12	
	13	BI.07
	14	
	15	BI.08
	16	
X122	1	BI.09
	2	
	3	BI.10
	4	
	5	BI.11
	6	
	7	BI.12
	8	
	9	BI.13
	10	
	11	BI.14
	12	
	13	BI.15
	14	
	15	BI.16
	16	

A3 — BIM P13 — REC670 — LOCATION=P13 — PLANT ADAPTED CONFIGURATION

SHT.241/D1 TO D10

X131	1	BI.01
	2	
	3	BI.02
	4	
	5	BI.03
	6	
	7	BI.04
	8	
	9	BI.05
	10	
	11	BI.06
	12	
	13	BI.07
	14	
	15	BI.08
	16	
X132	1	BI.09
	2	
	3	BI.10
	4	
	5	BI.11
	6	
	7	BI.12
	8	
	9	BI.13
	10	
	11	BI.14
	12	
	13	BI.15
	14	
	15	BI.16
	16	

A3 — BIM P14 — REC670 — LOCATION=P14 — PLANT ADAPTED CONFIGURATION

SHT.242/D1 TO D10

X141	1	BI.01
	2	
	3	BI.02
	4	
	5	BI.03
	6	
	7	BI.04
	8	
	9	BI.05
	10	
	11	BI.06
	12	
	13	BI.07
	14	
	15	BI.08
	16	
X142	1	BI.09
	2	
	3	BI.10
	4	
	5	BI.11
	6	
	7	BI.12
	8	
	9	BI.13
	10	
	11	BI.14
	12	
	13	BI.15
	14	
	15	BI.16
	16	

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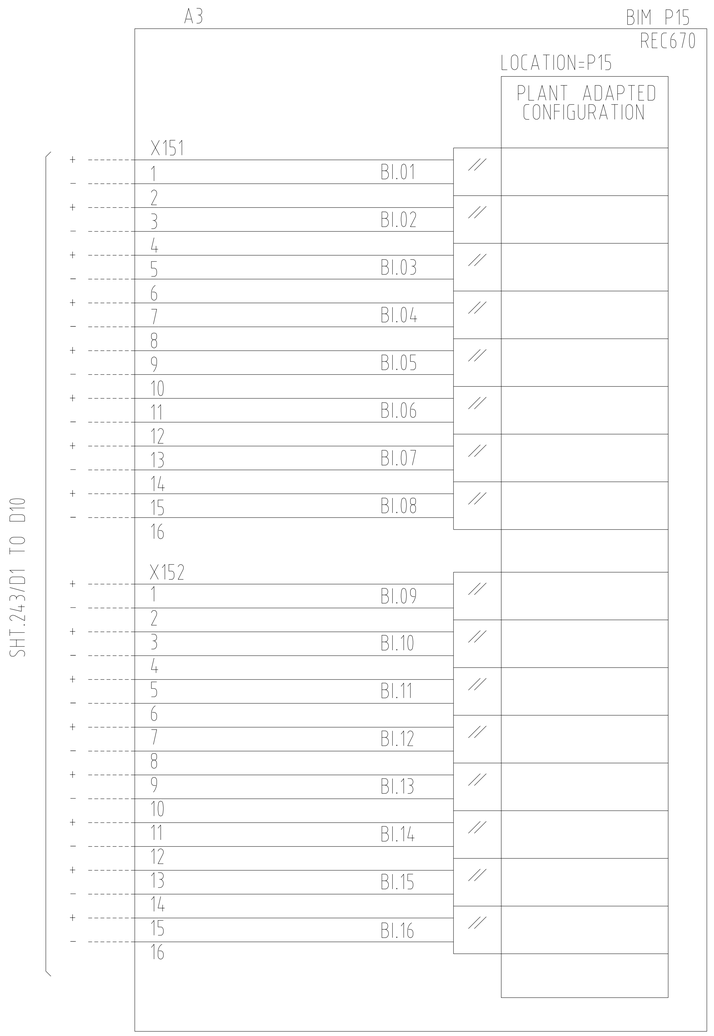

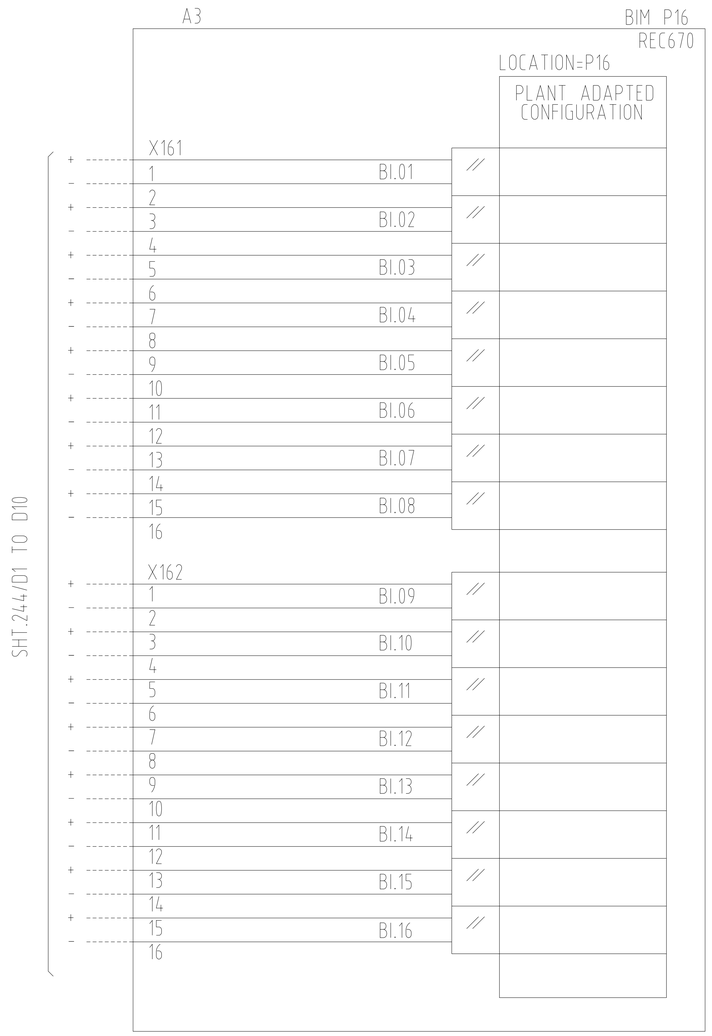

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INTERNAL REFERENCE	X3 AC CKT.	
211/A3	1	1
211/B3	2	2
211/A3	3	3
211/B3	4	4
211/B3	5	5
211/C3	6	6
211/B3	7	7
211/C3	8	8
SPARE	9	9
SPARE	10	10

INTERNAL REFERENCE	X51 CONTROL & PROTN.	
231/D1	1	1
231/D2	2	2
231/D3	3	3
231/D3	4	4
231/D4	5	5
231/D4	6	6
231/D5	7	7
231/D5	8	8
231/D6	9	9
231/D6	10	10
231/D7	11	11
231/D8	12	12
231/D8	13	13
231/D9	14	14
231/D9	15	15
231/D10	16	16
232/D2	17	17
232/D2	18	18
232/D3	19	19
232/D3	20	20
232/D4	21	21
232/D4	22	22
232/D5	23	23
232/D5	24	24
232/D6	25	25
232/D6	26	26
232/D7	27	27
232/D8	28	28
232/D8	29	29
232/D9	30	30
232/D9	31	31
232/D10	32	32
233/D2	33	33
233/D2	34	34
233/D3	35	35
233/D3	36	36
233/D4	37	37
233/D4	38	38
233/D5	39	39
233/D5	40	40
233/D6	41	41
233/D6	42	42
233/D7	43	43
233/D8	44	44
233/D8	45	45
233/D9	46	46
233/D9	47	47
233/D10	48	48
234/D2	49	49
234/D2	50	50

INTERNAL REFERENCE	X51 CONTROL & PROTN.	
234/D3	51	51
234/D3	52	52
234/D4	53	53
234/D4	54	54
234/D5	55	55
234/D5	56	56
234/D6	57	57
234/D6	58	58
234/D7	59	59
234/D8	60	10
234/D8	61	61
234/D9	62	62
234/D9	63	63
234/D10	64	64
235/D2	65	65
235/D2	66	66
235/D3	67	67
235/D3	68	68
235/D4	69	69
235/D4	70	70
235/D5	71	71
235/D5	72	72
235/D6	73	73
235/D6	74	74
235/D7	75	75
235/D8	76	76
235/D8	77	77
235/D9	78	78
235/D9	79	79
235/D10	80	80
SPARE	81	81
SPARE	82	82
SPARE	83	83
SPARE	84	84
SPARE	85	85
SPARE	86	86
SPARE	87	87
SPARE	88	88
SPARE	89	89
SPARE	90	90

INTERNAL REFERENCE	X41 DC CKTS.	
231/A2	1	1
231/A8	2	2
231/A8	3	3
231/A8	4	4
231/A9	5	5
231/A9	6	6
231/A9	7	7
231/A9	8	8
232/A2	9	9
232/A8	10	10
232/A8	11	11
232/A8	12	12
232/A9	13	13
232/A9	14	14
232/A9	15	15
232/A9	16	16
233/A2	17	17
233/A6	18	18
233/A7	19	19
233/A7	20	20
233/A8	21	21
233/A8	22	22
233/A8	23	23
233/A8	24	24
234/A2	25	25
234/A6	26	26
234/A7	27	27
234/A7	28	28
234/A8	29	29
234/A8	30	30
234/A8	31	31
234/A8	32	32
235/A2	33	33
235/A6	34	34
235/A7	35	35
235/A7	36	36
235/A8	37	37
235/A8	38	38
235/A8	39	39
235/A8	40	40
SPARE	41	41
SPARE	42	42
SPARE	43	43
SPARE	44	44
SPARE	45	45
SPARE	46	46
SPARE	47	47
SPARE	48	48
SPARE	49	49
SPARE	50	50

INTERNAL REFERENCE	X52 CONTROL & PROTN.	
236/D1	1	1
236/D2	2	2
236/D3	3	3
236/D3	4	4
236/D4	5	5
236/D4	6	6
236/D5	7	7
236/D5	8	8
236/D6	9	9
236/D6	10	10
236/D7	11	11
236/D8	12	12
236/D8	13	13
236/D9	14	14
236/D9	15	15
236/D10	16	16
237/D2	17	17
237/D2	18	18
237/D3	19	19
237/D3	20	20
237/D4	21	21
237/D4	22	22
237/D5	23	23
237/D5	24	24
237/D6	25	25
237/D6	26	26
237/D7	27	27
237/D8	28	28
237/D8	29	29
237/D9	30	30
237/D9	31	31
237/D10	32	32
238/D2	33	33
238/D2	34	34
238/D3	35	35
238/D3	36	36
238/D4	37	37
238/D4	38	38
238/D5	39	39
238/D5	40	40
238/D6	41	41
238/D6	42	42
238/D7	43	43
238/D8	44	44
238/D8	45	45
238/D9	46	46
238/D9	47	47
238/D10	48	48
239/D2	49	49
239/D2	50	50

INTERNAL REFERENCE	X52 CONTROL & PROTN.	
239/D3	51	51
239/D3	52	52
239/D4	53	53
239/D4	54	54
239/D5	55	55
239/D5	56	56
239/D6	57	57
239/D6	58	58
239/D7	59	59
239/D8	60	10
239/D8	61	61
239/D9	62	62
239/D9	63	63
239/D10	64	64
240/D2	65	65
240/D2	66	66
240/D3	67	67
240/D3	68	68
240/D4	69	69
240/D4	70	70
240/D5	71	71
240/D5	72	72
240/D6	73	73
240/D6	74	74
240/D7	75	75
240/D8	76	76
240/D8	77	77
240/D9	78	78
240/D9	79	79
240/D10	80	80
SPARE	81	81
SPARE	82	82
SPARE	83	83
SPARE	84	84
SPARE	85	85
SPARE	86	86
SPARE	87	87
SPARE	88	88
SPARE	89	89
SPARE	90	90

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INTERNAL REFERENCE	X42 DC CKTS.
236/A2	1
236/A8	2
236/A8	3
236/A8	4
236/A9	5
236/A9	6
236/A9	7
236/A9	8
237/A2	9
237/A8	10
237/A8	11
237/A8	12
237/A9	13
237/A9	14
237/A9	15
237/A9	16
238/A2	17
238/A6	18
238/A7	19
238/A7	20
238/A8	21
238/A8	22
238/A8	23
238/A8	24
239/A2	25
239/A6	26
239/A7	27
239/A7	28
239/A8	29
239/A8	30
239/A8	31
239/A8	32
240/A2	33
240/A6	34
240/A7	35
240/A7	36
240/A8	37
240/A8	38
240/A8	39
240/A8	40
SPARE	41
SPARE	42
SPARE	43
SPARE	44
SPARE	45
SPARE	46
SPARE	47
SPARE	48
SPARE	49
SPARE	50

INTERNAL REFERENCE	X53 CONTROL & PROTN.
241/D1	1
241/D2	2
241/D3	3
241/D3	4
241/D4	5
241/D4	6
241/D5	7
241/D5	8
241/D6	9
241/D6	10
241/D7	11
241/D8	12
241/D8	13
241/D9	14
241/D9	15
241/D10	16
242/D2	17
242/D2	18
242/D3	19
242/D3	20
242/D4	21
242/D4	22
242/D5	23
242/D5	24
242/D6	25
242/D6	26
242/D7	27
242/D8	28
242/D8	29
242/D9	30
242/D9	31
242/D10	32
243/D2	33
243/D2	34
243/D3	35
243/D3	36
243/D4	37
243/D4	38
243/D5	39
243/D5	40
243/D6	41
243/D6	42
243/D7	43
243/D8	44
243/D8	45
243/D9	46
243/D9	47
243/D10	48
244/D2	49
244/D2	50

INTERNAL REFERENCE	X53 CONTROL & PROTN.
244/D3	51
244/D3	52
244/D4	53
244/D4	54
244/D5	55
244/D5	56
244/D6	57
244/D6	58
244/D7	59
244/D8	60
244/D8	61
244/D9	62
244/D9	63
244/D10	64
SPARE	65
SPARE	66
SPARE	67
SPARE	68
SPARE	69
SPARE	70
SPARE	71
SPARE	72
SPARE	73
SPARE	74
SPARE	75
SPARE	76
SPARE	77
SPARE	78
SPARE	79
SPARE	80

INTERNAL REFERENCE	X43 DC CKTS.
241/A2	1
241/A8	2
241/A8	3
241/A8	4
241/A9	5
241/A9	6
241/A9	7
241/A9	8
242/A2	9
242/A8	10
242/A8	11
242/A8	12
242/A9	13
242/A9	14
242/A9	15
242/A9	16
243/A2	17
243/A6	18
243/A7	19
243/A7	20
243/A8	21
243/A8	22
243/A8	23
243/A8	24
244/A2	25
244/A6	26
244/A7	27
244/A7	28
244/A8	29
244/A8	30
244/A8	31
244/A8	32
235/A2	33
235/A6	34
235/A7	35
235/A7	36
235/A8	37
235/A8	38
235/A8	39
235/A8	40
SPARE	41
SPARE	42
SPARE	43
SPARE	44
SPARE	45
SPARE	46
SPARE	47
SPARE	48
SPARE	49
SPARE	50

INTERNAL REFERENCE	X4 DC CKTS.
216/B3	1
216/B3	2
SPARE	3
SPARE	4
SPARE	5

REFERENCE	X61 ALM. CKT.
212/E5	1
212/E5	2
290/E5	3
290/E6	4
SPARE	5
SPARE	6
SPARE	7
SPARE	8
SPARE	9

REFERENCE	X6 ALM. CKT.
212/C5	1
212/C5	2
290//E5	3

INTERNAL REFERENCE	XSH SPACE HEATER
211/E7	1
211/F7	2
SPARE	3

INTERNAL REFERENCE	XTJ T.JACK
211/D3	1
211/D3	2
211/D3	3
211/D3	4
SPARE	5

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 48	AS MANUFACTURED
00	13 20	FOR APPROVAL

DRAWN BY NSK CHECKED BY JKR

DATE STARTED 15.3.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

TERMINAL BLOCK REFERENCE

SAS INTERFACE PANEL +SAS I/F-3

S/S 8709 S-13656

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
P	C421	CD-323015	302	NIL	01

NG/D2-D (2012/01)

DMS VECTOR NGD200

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